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Contributions.

Some Information from Indicator Cards.

JERSEY CITY, Jan. 15, 1896.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The accompanying indicator cards are sent for the sake of illustrating the usefulness of the indicator as applied to locomotives. In fact, it is the only way of obtaining data valuable to the mechanical engineer as re-

to be shortened so as to increase the port opening at the crank-end and decrease it at the head-end.

The valve having  $1\frac{1}{2}$ -in. outside lap was removed and one substituted having  $1\frac{1}{2}$  in. outside lap,  $\frac{3}{8}$  in. inside clearance at the back edge of exhaust cavity of valve, and the valves set with  $\frac{1}{2}$ -in. lead in full forward gear and  $\frac{1}{4}$ -in. lead in full backward gear. Card No. 4 was taken with full throttle and reverse lever in eleventh notch corresponding to a cut-off of 6 in. The result of this change was that the performance of the engine was almost all that could be desired.

Card No. 7 was taken with the reverse lever in the tenth notch and the throttle three-quarters open, and it will be noticed that the mean effective pressure and the indicated horse power is less than that of Card 4, due to the slower speed and less throttle, the cut-off of course being longer. The improvement in the steam distribution, as shown by cards Nos. 4 and 7, is very instructive indeed. Card No. 6 is shown on account of being taken at a slower speed and the reverse lever giving a cut off of  $8\frac{1}{2}$  in. which sharply define the points of admission, cut-off, release and compression.

Card No. 1 is shown on account of being taken cutting off at full stroke, so as to illustrate the effect of inside clearance. The reversing of the direction of the compression curve is due to the fact that in the slower speeds more steam blows over to the opposite end of the cylinder than in the higher speeds. This condition of blowing over exists in cards 4, 5, 6 and 7, but in a less degree. It will be noticed in all the cards that the compression curve begins earlier and rises more quickly in the head-end than in the crank-end, and that the mean effective pressure is slightly greater in the head end than in the crank-end. Special attention is directed to the instructive difference between cards 5 and 7, both being taken under practically the same conditions, except that card 7 was taken with the throttle three-fourths open, and had it been taken with full throttle the difference would be more marked. It is well known that with a valve having neither inside clearance nor inside lap release and compression are coincident, and the effect on the indicator card is the same if the valve be given inside clearance at one end only, as, when release has taken place at one end, exhaust closure, or compression, has not taken

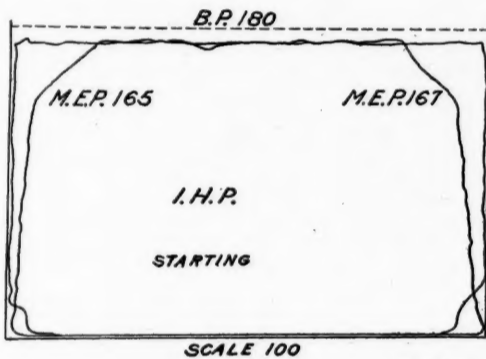
unless the valves were gone over in the shop and the points obtained by actual measurement. The engine should be steamed up so as to get as nearly as possible the conditions in service. I have in mind two engines, the valves of which were gone over. The first one had 6 in. valve travel and valves set with  $\frac{1}{8}$  in. negative lead in full forward gear, and  $\frac{3}{8}$  in. negative lead in full backward gear. The other one had 5 in. valve travel and the valves were set with  $\frac{1}{8}$  in. lead in full forward gear and  $\frac{3}{8}$  in. lead in full backward gear, and both the engines give satisfactory service. The engineer of the latter engine states that he could run the engine hooked up very high. The large positive lead in backward gear explains this, as the cut-offs for similar notches would be longer than if the engine had been set with  $\frac{1}{8}$  in. lead in both forward and backward motion.

Card No. 2 was taken from an engine having 5-in. valve travel and valves set with  $\frac{1}{8}$ -in. positive lead in both motions. The point A designates the point of admission of steam to the cylinder previous to the piston reaching the end of the stroke. The dotted line represents the boiler pressure 163 pounds and it will be noticed that the steam chest pressure rises about 40 pounds above this, and at the time when the valve is open and the cylinder in direct communication with the boiler. This pressure is probably due to the steam being compressed momentarily above boiler pressure and the time being too short for the current of entering steam "due to excessive lead" to reverse in motion to indicate on the gage on boiler, or can this rise in pressure be due to a shock transmitted to the indicator caused by the impact of the two currents of steam and really does not represent the pressure in the steam chest?

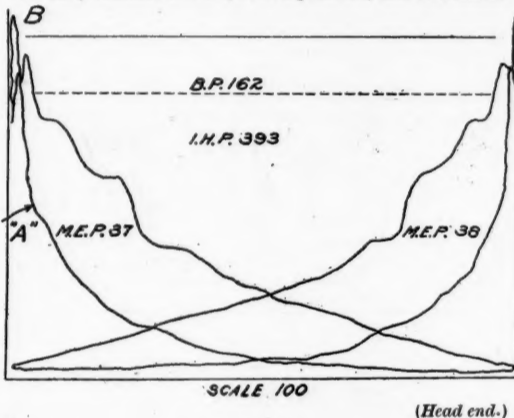
If the valve opened at the point B the problem would be perfectly clear, as the compression would be greater than boiler pressure and when the valve opened the pressure would drop to or a little below steam chest pressure and finally when the momentum has been destroyed by the spring, the spring and the steam will be in equilibrium.

In determining the amount of inside clearance, it is important that the correct lead is used, as inside clearance will not correct the errors in this direction.

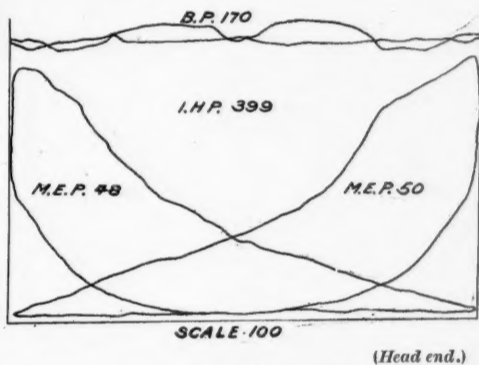
In setting the valves on a certain class of engines, it



Card 1.



Card 2.  
Revs. per minute, 268.  
Miles per hour, 55.



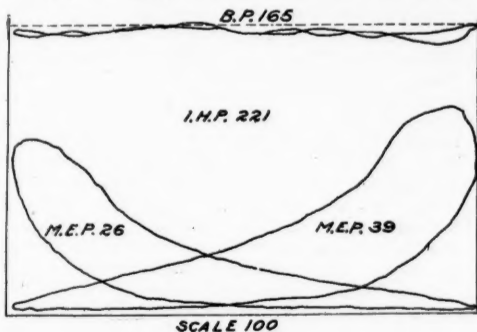
Card 4.  
Revs. per minute, 240.  
Miles per hour, 57.

gards steam distribution in the cylinders of a steam engine.

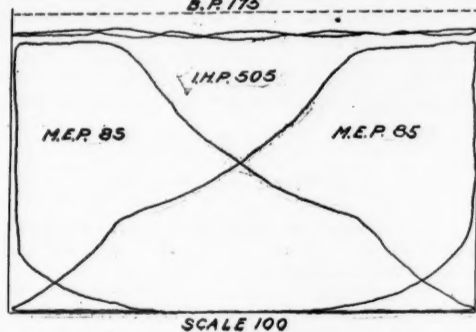
Cards Nos. 1, 4, 5, 6 and 7 were taken from an engine having 6 ft. 8 in. drivers, 19 in. x 24 in. cylinders and 6-in. valve travel. Card No. 5 was taken with a valve  $1\frac{1}{2}$  in. outside lap,  $\frac{1}{8}$  in. inside clearance at the back edge of exhaust cavity of valve. The valves were set according to shop figures, with zero lead in full forward gear and  $\frac{1}{4}$  in. negative lead in full backward gear. The

place at the opposite end, and steam blows over to the end having the lesser pressure. It will be noticed that at a speed of 57 miles per hour (Card No. 4) there are no indications of "loops," and it is quite possible that the speed could be increased to 65 miles per hour under the same conditions without giving "loops" due to excessive lead when the engine is "hooked up," and it is evident that there was sufficient steam in the cylinder at exhaust closure to take up the inertia of the piston, etc.,

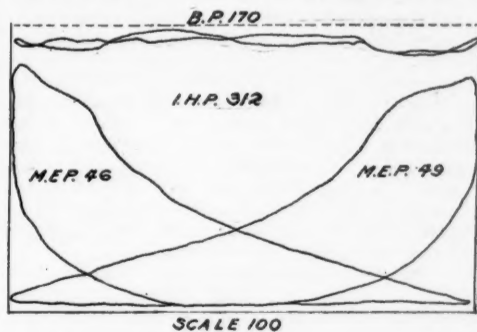
was not difficult to get the valves to cut off equal back and front, but the sounding of the exhaust would indicate that the engine was "lame." This is due to the angularity of the connecting rod, in other words, it was found that with a uniform release in the cylinders, that the rotation of the wheel from the forward center to the release, going back, was less than from the back center to the release, going forward. The valves were cut out at back edge of exhaust cavity a predetermined amount



Card 5.  
Revs. per minute, 198.  
Miles per hour, 47.



Card 6.  
Revs. per minute, 88.  
Miles per hour, 21.



Card 7.  
Revs. per minute, 192.  
Miles per hour, 46.

engine had not been developing sufficient power to do the service it had been assigned to, and it was decided to apply the indicator. Card No. 5 was taken with full throttle and reverse lever in tenth notch, corresponding to a cut-off of 5 in. It is evident upon an examination of the card that there was not sufficient port opening in the running cut-off to fully utilize the steam-chest pressure at the beginning of the piston stroke. The valves sounded fairly well notwithstanding that the head-end was doing about 30 per cent. more work than the crank-end, and in order to have the engine give uniform diagrams back and front, the eccentric rods would have

without raising the pressure in the clearance spaces above steam chest pressure.

The Bilgram, or any other diagram, is very useful in designing and proportioning parts of the valve gear, but after all this has been done and instructions given therefrom for setting the valves in the shop, the figures obtained as to the lead points are often deceptive, as has been shown by indicator cards, and the distortions in the valve gear introduced by the angularities of main rod and eccentric rod and make it almost impossible to calculate what the lead and other points would be when the engine would be running in the shorter cut-offs,

so as to make release take place diametrically opposite each other on the wheel.

Increased Heating Surface in Locomotives.

NEW YORK, Jan. 15.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It appears to be the opinion of many persons well informed in locomotive engineering, that unless ways and means are discovered for increasing the "heating surface" in locomotive boilers, the engine in its present most advanced development has about reached the limit of its

capacity. The grate area in locomotives has been enlarged until it is virtually impossible to increase its size, the driving wheels limiting the width, and bridges and the center of gravity the height of the boiler; and it appears to be conceded that no advantage would result from making the boiler longer.

One engineer of distinction, viz., Mr. Forsyth, of the C., B. & Q., suggests the substitution of a special type of water-tube boiler, but I hardly think this will mend matters, as all boilers of this type that have hitherto been tried in locomotives are understood to have proved unsatisfactory. The solution of the difficulty of increasing the efficiency of locomotive boilers would therefore seem to rest in the increased heating surface of the tubes, and the object of this communication is to suggest how this can be brought about. The only change necessary to accomplish this desirable end, other than the change of tubes, will be the change of tube-sheets in existing locomotives.

When we speak of heating surface, we mean, of course, heat-absorbing surface. Now there are some things that we know, and among these is the fact, that unless the heat in its passage through the tubes is absorbed by them, the tubes do very little good other than to act as longitudinal stays to the boiler and as an outlet from the firebox to the smokestack for the products of combustion. The advantage of the tubes, therefore, so far as the generation of steam is concerned, must be measured absolutely by the amount of heat they can be made to absorb in the passage of the gases through them, for unless the heat is first taken up by the tubes, it natu-

is estimated by the highest authorities at something under five per cent., and that the waste of fuel or power in the manner we are using coal at present, is estimated at something over 95 per cent., and locomotives are probably no exception to this rule.

HEAT-ABSORBING OR FIRE SURFACE OF PLAIN AND SERVE'S LOCOMOTIVE TUBES PER SQUARE FOOT OF TUBE SHEET.

Outside diameter.	Spaces between tubes.	Tubes per sq. ft. tube-sheet.	Area for passage of the gases per sq. ft. tube-sheet.	Heat-absorbing or fire surface per foot of length per sq. ft. of tube-sheet.	Percent. increase.
2 in. plain...	5/8 in.	24.4	62.37	11.47	Percent.
2 3/4 " ribbed...	5/8 "	11.75	50.42	15.04	31.12
2 " plain...	5/8 "	24.4	62.37	14.47	
2 3/4 " ribbed...	5/8 "	10.96	47.	12.02	22.2
2 1/4 " plain...	5/8 "	17.43	57.6	9.4	60.
2 3/4 " ribbed...	5/8 "	11.75	50.42	15.04	
2 1/4 " plain...	5/8 "	16.	43.024	8.64	62.2
2 3/4 " ribbed...	5/8 "	10.96	47.	14.02	
2 1/4 " plain...	5/8 "	14.75	60.58	8.8	70.9
2 3/4 " ribbed...	5/8 "	11.75	50.42	15.04	
2 1/4 " plain...	5/8 "	15.63	55.8	8.17	71.6
2 3/4 " ribbed...	5/8 "	10.96	47.	14.02	

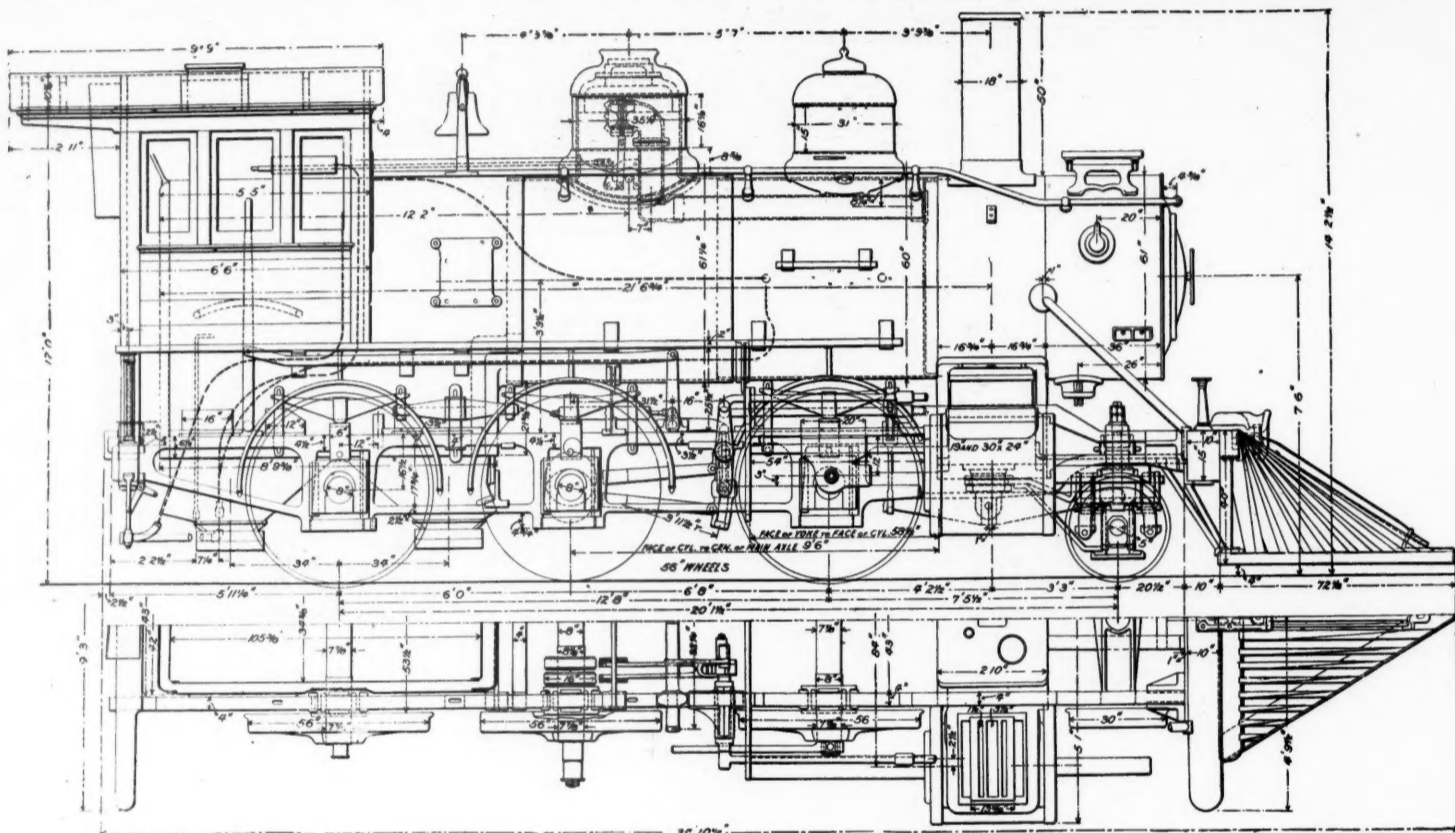
The increased evaporation obtained by the use of Serve ribbed tubes in France has been so great that one railroad, the Paris, Lyons & Mediterranean, is now, I believe, using them exclusively in all new locomotives, and

the bridge, at least two tracks in the direction of travel would be required.

Were there no elevated cars to cross the bridge, I am satisfied that three tracks for trolleys would suffice, because they could then be placed side by side, and two of them could be used during the crowded hours for passengers going in the same direction, while the third track could be used for returning the empty cars. But as elevated tracks are also provided for, three trolley tracks could have no cross-over without being side by side. Such arrangement would require the elevated tracks to be outside the trolleys, one on each side, in which case the elevated tracks would have no cross-overs. On the whole, the best arrangement seems to be to place the elevated tracks in the middle, and to have two trolley tracks on each side of them. Then all could have cross-overs wherever necessary.

With such an arrangement, I find that the live load over the whole bridge, (including the roadways and the footwalks) under the present condition of traffic, would not exceed 10,000 pounds per running foot of the bridge; but I prefer to provide for future contingencies by calling it 12,000 pounds per foot run, which is 3,000 pounds per running foot less than, in my former approximate estimate, I had assumed for a bridge of four tracks. Consequently I am of the opinion that the bridge can be constructed with six tracks at a cost not to exceed that of my former approximate estimate for four tracks.

But if the width is limited to 118 ft. the footwalks must be put above the carriageways. I would much prefer to have them outside the trusses and on the same level with



Side View and Plan of Richmond Compound Mogul Locomotive for the Missouri, Kansas & Texas.

rally cannot be given out or distributed by them to heat the water.

Everybody knows, who has taken the trouble to look into the matter, that much the most of the heat passing through the ordinary plain boiler tube is entirely lost, and passes into the smokestack essentially unused, because the action of the draft is to draw the gaseous stream into the center of the tube and away from the friction of its walls; so that most of the heat imparted to the ordinary plain tube comes from radiation, which is enormously less than the heat obtained by actual contact of the metal with the products of combustion. On its entrance into the tube the gaseous stream fills up the orifice, but it immediately begins to stretch itself out, and is much less voluminous on its exit into the smokestack than when it entered the tube.

Now, the cure for these shortcomings is to adopt a tube that will counteract or nullify them to the greatest extent, and such a tube is the one that has the most heat-absorbing surface, viz., the Serve ribbed tube, which averages over 90 per cent. more of this surface and 60 per cent. more weight of metal than the ordinary plain boiler tube. In the passage of the gaseous stream through this tube, the ribs penetrate it on all sides, extract the heat from it, and convey it to the surface of the tube, which is thereby made hotter and consequently in a condition to evaporate more water.

The Serve tube should be used in locomotives of 2 3/4 in. O. D. to compensate for the area for the passage of the gases taken up by the ribs, and I hand you a table herewith showing what the gain in heat-absorbing surface is between the different diameters of tubes commonly used in locomotives per square foot of tube-sheet, spaced at different distances apart.

Let us not forget that the energy or power extracted from coal, as used in the average boiler the world over,

has changed the tubes and tube-sheets in some 250 old ones. Serve tubes are also used to a greater or less extent on all the French railroads.

Judged by its results, which would appear to be the only reasonable way to look at the cost of any mechanical improvement, the Serve tube is the cheapest in the market, because by its economy (or increased steaming capacity, which is the same thing), it soon pays for itself outright, and then goes right along and makes money for its owners.

C. W. WHITNEY.

#### East River Bridge—New York.

At a meeting of the East River Bridge Commission last week, the Chief Engineer, Mr. L. L. Buck presented the following report:

I have the honor to report the result of the conferences not only with the engineers of the Brooklyn trolley lines, but also with Mr. Pearson and Mr. Knight, independent consulting electrical engineers of high authority, regarding the feasibility of operating trolley cars in trains under the control of the motorman of the leading car, the development of trolley cars to be expected in the future, and the provision required to be made for them on the bridge. Mr. Knight's report is herewith submitted. Mr. Pearson will appear before you with his report to-day.

These reports agree in the opinion that at present there are no adequate means of running trolley cars in the way suggested. Therefore, if trolley cars are to be run across the bridge under present conditions, it must be singly, or with motor cars and three or four trailers. Under these circumstances it would be idle to think of carrying an adequate number of passengers during the crowded hours on one track. If trolley cars are to cross

the other tracks, because such arrangement would afford a better distribution of the weights upon the cables, and would be less laborious for pedestrians. It would cost no more, except for the right of way, to put them outside than to place them over the carriageways.

In this connection I would again suggest the advisability of removing all buildings, for the length of the bridge approaches, between Broome and Delancey streets in New York, and between South Fifth and South Sixth streets in Brooklyn, and letting the cities use the space not occupied by the bridge for small parks. This would be a benefit to both cities; it would afford advantageous views of the bridge which could be obtained in no other way, and it would give much-needed breathing spaces in the most densely populated regions of both cities. It would also give the room needed for the storage of material during construction.

If this suggestion could be adopted, there would be no objections to putting the footwalks on the outside, and all danger from fire would be avoided. It may be that the Park Commissioners or other proper officers would co-operate with the Bridge Commission in obtaining this object.

#### The Accountability of Directors.

At the recent meeting of the Bar Association of New York at Albany Mr. Henry W. Jessup, of New York City, read a paper on the question, Are Directors of Corporations Held to a Sufficient Accountability? The speaker quoted the following passage from Cook on stockholders:

"In these latter days the robbery and spoliation of corporations and stockholders by the corporate directors and managers have been systematized into well-known methods of proceeding, and the carrying out of such plans has become a profession and an accomplishment.

The skill, audacity, experience and talent of the highest order of administrative ability have reduced to a certainty the methods of diverting the profits, capital and even the existence of the corporation itself to the enrichment of the corporate managers and their co-conspirators. Illegitimate gains are secured and enormous fortunes are amassed by the few at the expense of the defrauded, but generally helpless, stockholders."

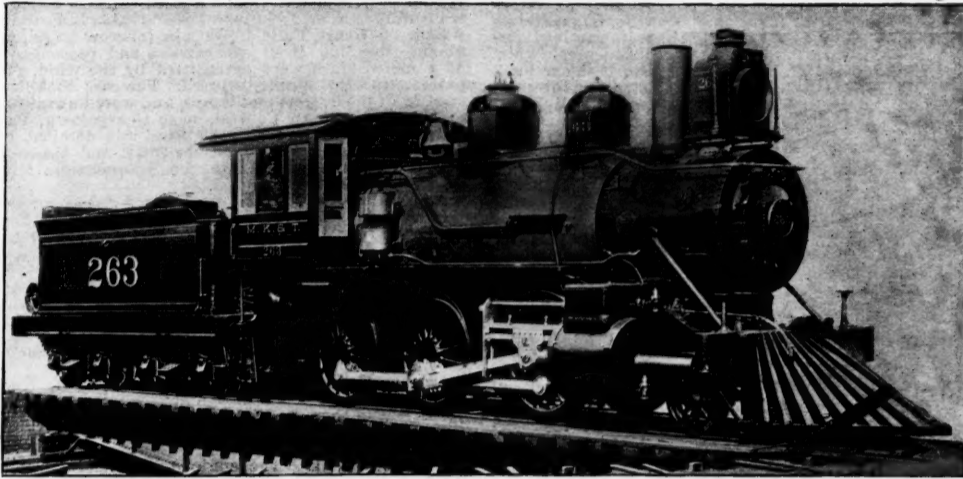
While indisposed to admit that the picture drawn by Mr. Cook is in all respects true, it is apparently justified by the history of many American corporations, whose stockholders hold gorgeously engraved certificates, as valueless as Confederate paper dollars, and whose directors have amassed fortunes not represented in that currency. And the two conditions, poverty for the shareholder, wealth for the director, seem to be traceable to a common period of time—the brief checkered life of the so-and-so mining or manufacturing, or railroad company.

I believe the fault, if any, lies, not in the disposition of the courts, nor in the limited remedies provided against breaches of trust in this class of cases, but, back of all, in

it appears like a revolutionary change, but in reality it is not such. The courts already differentiate corporate directors and hold them to varying degrees of liability, according to their activity of function. Thus, I suggest nothing more than an embodiment in our statute books of rules of equity, and the addition of such efficient modes of procedure as shall afford speedy redress for the injuries that stockholders and those dealing with the corporations, as well as the public, may have sustained.

#### Compound Mogul Locomotive.—Missouri, Kansas & Texas Railway.

The Richmond Locomotive and Machine Works, having had marked success with its compound locomotives has recently completed a compound mogul for the Missouri, Kansas & Texas Railway. It is designed for freight service and has cylinders 19 in. and 30 in. x 24 in. Through the courtesy of the builders we are enabled



Richmond Compound Mogul Locomotive for the Missouri, Kansas & Texas.

the reckless and unguarded modes in which legislatures permit corporations of almost all kinds to be created and set in full and vigorous operation, with managers whose accountability is vaguely defined or largely misunderstood.

The general corporation law of this state defines "directors" when used in relation to corporations, as including "trustees or other persons by whatever name known, duly appointed or designated to manage the affairs of the corporation." The same act, together with the Penal Code, defines with considerable rigor the liability of such directors to the people, to corporate creditors and to the stockholders—so that it would seem that so far as the Legislature could do so it has safeguarded the stockholder and, therefore, that if his rights are unredressed the fault must lie in the courts. But this I do not believe, and so I venture the suggestion that the trouble is due to a lack of differentiation or classification of directors in our statute law. Let me illustrate: The advertising columns of our daily papers frequently contain lists of the boards of directors of banks, trust companies and other corporations, which include names of men whose standing is calculated to invite popular confidence in the corporation. Some of these names appear in the boards of several such companies. And yet everyone knows that their relation to the bank or company in question is nominal, or at most advisory. On the other hand, there are a great number of corporations whose managers or trustees assume the entire control and management of the company's business. These two extremes represent two radically different kinds of trustees, between whom our General Corporation Law draws no distinction.

In continental Europe these two classes of corporate directors are differentiated as to their functions as well as their accountability. What we call a stock corporation is in France, styled "Société Anonyme," or an anonymous company, or society. Such companies organize with two classes of directors, the one actual managers, the other mere mandatories with specified and limited functions. Could the rights of stockholders be better safeguarded, and their remedies against breaches of trust on the part of corporate trustees be made more sure and efficient, by differentiating directors as to their activity of functions, and requiring or permitting in all stock corporations two classes of directors? Let us see. It is a well-accepted proposition that directors of a corporation may be called to account for breaches of trust. But the working of this rule is somewhat qualified by requirements of law in cases where it is sought to hold directors personally liable for malfeasance:

First—The complaining stockholder must offer affirmative proof of the misconduct charged, going to establish fraud in fact.

Second—A condition precedent to such a stockholders' action is the refusal or neglect of the corporation to demand redress. A litigant must satisfy the court that he has exhausted all the means within his reach to obtain, within the corporation itself, the redress of his grievances, before he can be permitted to institute a litigation which usually belongs to the corporation.

These two things often conspire to make the complaining stockholder's path a difficult, slow and costly one to tread.

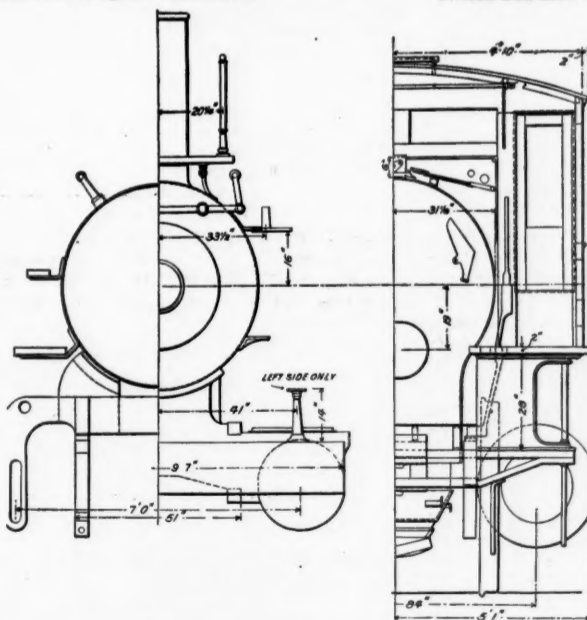
Conceding these practical difficulties, we nevertheless find the courts of equity ready to hold directors answerable for or to enjoin them from any action injurious to the corporation or shareholders. All remedial law has ever been leaden-footed. Corporations are theoretically managed by directors. As a matter of fact, they are in most cases run by officers. The stockholders who elected the director as a trustee supposedly capable and responsible may discover that a fraud has been perpetrated and that the person answerable to him in damages is not the substantial trustee, but a wholly irresponsible officer, against whom it is not worth his while to proceed. Now, on such a state of facts, the courts will probably exonerate the director who is not shown to have been guilty of actual fraud.

A careful examination of the General Corporation Law and Stock Corporation Law convinces me that the amendments necessary to carry the Continental scheme into operation would be few and simple. At first sight

to give engravings from a photograph and drawings of this engine. The weight on drivers is 106,980 lbs., and the total weight 120,080 lbs. The boiler is of the straight top type with a 60-in. barrel. The plates are 1/2-in. Otis steel, and the working steam pressure is 170 lbs. The firebox is 8 ft. 1/2-in. long, 34 1/2 in. wide, and has a crown sheet 3/8-in. thick stayed with crown bars. It has a heating surface of 146 sq. ft., while the tubes have 1,372 sq. ft. giving a total of 1,518 sq. ft. The grate has 23 sq. ft. area.

The driving wheels are 56 in. in diameter with cast-iron centers and Midvale tires. The crosshead is of the Laird type. The system of compounding has been previously described in the *Railroad Gazette*, and will not be repeated here.

The tender has two four wheel trucks furnished with Schoen pressed steel bolsters. The transoms are channels, and the trucks are of the rigid diamond type with elliptical springs. The tank has a capacity of 4,000 gallons, and here is a coal space of 6 tons. The New York Air Brake Company's equipment is used on both engine and tender. The latter has National hollow brake beams, and Sargent brake shoes.



Richmond Compound—Sectional Views.

The engine is fitted with Nathan sight feed lubricator, Monitor injector, Coales safety valves, Sargent brake shoes, Ashcroft steam gages, and driving springs made by Chas. Scott & Co.

The table gives the principal dimensions.

Description.	
Type.....	Mogul
Name or number.....	233
Name of builder.....	Richmond Loco. & Mach. Works
Name of operating road.....	Missouri, Kansas & Texas
Gage.....	4 ft. 9 in.

Simple or compound.....	Compound
Kind of fuel to be used.....	Bituminous coal
Weight on drivers.....	106,980 lbs.
" truck wheels.....	13,100 "
" total.....	120,080 "

General Dimensions.	
Wheel base, total, of engine.....	20 ft. 1 1/4 in.
" " driving.....	12 " 8 "
" " total (engine and tender).....	45 " 3/4 "
Length over all, engine.....	32 " 11 1/4 "
" " total (engine and tender).....	57 " 10 3/4 "
Height, center of boiler above rails.....	7 " 6 "
" of stack.....	14 " 2 1/4 "
Heating surface, firebox.....	146 sq. ft.
" tubes.....	1,372 "
" total.....	1,518 "
Grate area.....	23 "

Wheels and Journals.	
Drivers, number.....	6
" diameter.....	56 in.
" material of centers.....	Cast iron
Truck wheels, diameter.....	30 in.
Journals, driving axle, size.....	8 x 8 1/2 "
" truck.....	5 x 8 "
Main crank pin, size.....	6 x 5 1/4 "

Cylinders.	
Cylinders, diameter.....	H. P. 19 in. L. P. 30 in.
Piston, stroke.....	24 "
" rod, diameter.....	3 1/4 "
Kind of piston rod packing.....	Jerome Metallic
Main rod, length center to center.....	6 ft. 8 1/4 in.
Steam ports, length.....	H. P. 23; L. P. 23 "
" width.....	1 1/4; " 23; " 3 1/4 "
Exhaust ports, length.....	" 23; " 3 1/4 "
" width.....	" 14; " 1 1/2 "
Bridge, width.....	" 14; " 1 1/2 "

Valves.	
Valves, kind of.....	Richardson Balanced
" greatest travel.....	H. P. 5 1/4; L. P. 6 in.
" outside lap.....	" 11; " 3/4 "
" inside clearance.....	" 3/8; " 3/8 "
" lead in full gear.....	" 1/4; " 1/4 "
" constant or variable.....	Variable

Boiler.	
Boiler, type of.....	Straight top
" working steam pressure.....	170 lbs.
" material in barrel.....	Otis steel
" thickness of material in barrel.....	1/2 in.
" diameter of barrel.....	60 "
Seams, kind of horizontal.....	Quadruple riveted
" circumferential.....	Double
Thickness of tube sheets.....	1 1/4 in.
" crown sheet.....	3/8 "
Crown sheet stayed with.....	Crown bars
Dome, diameter.....	31 1/2 in.

Tubes.	
Tubes, Number.....	228
" material.....	Charcoal Iron
" outside diameter.....	2 in.
" length over sheets.....	11 ft. 6 "

Firebox.	
Firebox, length.....	8 ft. 0 1/2 in.
" width.....	34 1/2 "
" depth from.....	62 1/2 "
" back.....	50 1/4 "
" material.....	Otis Hom. Cast Steel
" thickness of sheets.....	3/8 "
" brick arch? No.....	
" water space, width, front 4 in.; sides 3 in.; back 3 in.	

Smokebox.	
Smokebox, diameter.....	61 in.
" length.....	73 1/4 "

Other Parts.	
Exhaust nozzle.....	Single
" diameter.....	4 1/4 in.
" distance of tip below center of boiler.....	2 1/4 "
Netting, wire or plate.....	Both
" size of mesh, 3 to 1 in. of perforation.....	3 x 1 in.
Stack.....	Straight
" least diameter.....	17 1/2 in.
" height above smokebox.....	4 ft. 2 "

#### Train Accidents in the United States in December.

##### COLLISIONS.

##### REAR.

1st, 11 p. m., on Delaware, Lackawanna & Western, at Preble, N. Y., a passenger train ran over a misplaced switch and into some freight cars standing on the side track, wrecking the engine and freight cars and the first two cars of the passenger train. The baggage car caught fire from the engine and a portion of the wreck was burned up, together with a storehouse near by. The engineman and fireman were killed. The switch had been maliciously misplaced, the lock being broken.

4th, on Norfolk & Western, at Ennis, W. Va., a freight train, with a helping engine at the rear, broke in two on an ascending grade, and the rear portion of the train ran back into the head of a following train, making a bad wreck; conductor, engineman and brakeman killed and fireman injured.

7th, on Pittsburgh & Lake Erie, at Newport, Pa., passenger train ran into the rear of a preceding freight making a bad wreck. One passenger and 3 employees were injured, 2 of the latter fatally. The wreck took fire and 2 cars of the passenger train and 8 of the freight were burned up. The freight train failed to flag the passenger train at the proper time.

14th, on Queen & Crescent, at High Bridge, Ky., a work train standing in a tunnel was run into by a freight train. The conductor and one brakeman of the work train were killed, and one man on the freight was injured. It is said that a flagman was sent to stop the freight, but failed to do so.

15th, on Delaware, Lackawanna & Western, near Dover, N. J., a freight train which had been stopped at a drawbridge was run into at the rear by a following freight, wrecking 6 cars of cattle. A drover was killed.

15th, on Northern Central, near York, Pa., a freight train descending a grade broke in two, and the rear portion afterward ran into the forward one. A brakeman was killed.

16th, on Cincinnati, Hamilton & Dayton, near Milton,

O., a passenger train ran over a misplaced switch and into the rear of a freight train standing on the sidetrack, wrecking the caboose and 12 freight cars. The engine-man, fireman and 36 passengers were injured.

16th, on Illinois Central, near Oxford, Miss., a freight train ran into the rear of a preceding freight, wrecking the caboose and overturning the engine. One conductor was fatally injured.

31st, 9 p. m., on Terminal Association tracks, in the tunnel at St. Louis, Mo., a passenger train of the Wabash road which had stopped on a curve was run into at the rear by a following passenger train of the Vandalia line. The fireman was killed and 2 other trainmen were injured. The signalman at the outgoing end of the tunnel block section had reported the Wabash train clear when in fact it was delayed in the tunnel.

And 22 others on 17 roads, involving 5 passenger and 30 freight and other trains.

#### BUTTING.

5th, on Boston & Albany, at Boston, butting collision between a passenger train entering the terminal sta-

17th, on Pennsylvania road, near Broad Street Station, Philadelphia, collision between a passenger train and a train of empty passenger cars, wrecking one car. A brakeman was killed. Many extra trains were running on the crowded tracks of the terminal at this time, in consequence of a great rush of passengers, which was due to the suspension of traffic on the street railroads on account of a strike.

19th, on Chicago, Peoria & St. Louis, near Madison, Ill., collision of freight trains; 1 brakeman killed.

19th, on Sonora Railway, at Nogales, Ariz., a passenger train, which had become uncontrollable on a descending grade in consequence of the supply of air for the brakes becoming exhausted, run into a carload of ore in the yard, wrecking the freight car, 2 locomotives and 1 passenger car. An employee jumped off the engine and was injured.

21st, on Boston & Albany, near Newton, Mass., a passenger train ran into a freight train which was switching on the main track, and the baggage master and one passenger were injured. There was a dense fog at the time.

25th, on Texas & Pacific, at Amesville, La., a freight train ran into some platform cars which had been carelessly left upon the main track, badly damaging the engine and cars. The engine-man and fireman were injured.

26th, on Philadelphia & Reading, at Perkiomen Junction, Pa., a passenger train, backing into a sidetrack, collided with some freight cars, and two passengers were injured.

27th, on Lake Shore & Michigan Southern, at East Buffalo, N. Y., collision of switching engines, injuring one engine-man.

28th, at Des Moines, Ia., a passenger train of the Des Moines & Kansas City was run into by a freight of the

Chicago Great Western, at the crossing of the two roads and the rear passenger car was overturned. Eight passengers were injured.

30th, on Metropolitan Elevated, at Lawndale avenue Chicago, collision of passenger trains, derailing one car. The conductor, motorman and one passenger were injured.

And 10 others on 10 roads, involving 5 passenger and 14 freight and other trains.

#### DERAILMENTS.

##### DEFECTS OF ROAD.

4th, on Savannah, Florida & Western, near Dinsmore, Fla., a passenger train was derailed by a broken frog; 2 trainmen and 3 passengers injured.

12th, on Colorado Midland, at Woodland, Col., a passenger train was derailed and 7 passengers were injured. It is said that the derailment was caused by a defective switch.

16th, on Erie road, near Narrowsburgh, N. Y., east-bound passenger train No. 10 was derailed, and the tender, 5 baggage cars and the smoking car fell down a bank. Three passengers and 2 trainmen were injured. It is said that the derailment was caused by a broken rail.

17th, on Southern Pacific, near Towles, Cal., a passenger train was derailed by a loose rail, and the first and second class sleeping cars fell down a bank. Several passengers were injured.

21st, on Louisville Southern, near McAfee, Ky., a freight train broke through a trestle bridge and 12 cars were wrecked. Two brakemen were injured, one fatally.

24th, on South Carolina & Georgia, at Charleston, S. C., a switching engine broke through a trestle bridge and fell to the ground below. Two trainmen were killed and one injured.

27th, on Illinois Central, near Water Valley, Miss., a

passenger train ran into an electric street car at a crossing, wrecking the car and derailing the locomotive, which, with the baggage car, fell into the ditch. The motorman was killed. Four men on the railroad train were injured.

23d, on Ohio Southern, near Jackson, O., a freight train was derailed at a misplaced switch, and the engine and several cars fell into the ditch. It is said that the switch was turned by a boy 18 years old, just as the engine approached it. The wrecker was caught, and is said to have made a confession. He is believed to be insane.

34th, on St. Louis & San Francisco, at Butler, I. T., a freight train was derailed by stones which had fallen upon the track, and the engine and several cars were wrecked; 3 trainmen injured.

26th, on Huntingdon & Broad Top, near Hopewell, Pa., a passenger train was derailed by running against a tree which had been blown across the track, and one employee was killed.

26th, on Pittsburgh & Lake Erie, near Newcastle, Pa., a passenger train was derailed by a malicious obstruction. It is said that a boy 14 years old, who has been arrested, has confessed to the crime. He says that he did it because he had been put off a train when he was stealing a ride.

27th, on Great Falls & Canada (narrow gage), near Shelby Junction, Mont., the caboose and passenger car of a mixed train were overturned by the wind, and 5 passengers were slightly injured. The cars took fire at once from the heaters and lamps, and were burned up.

31st, on Northern Central, near Georgetown, Pa., a freight train running at high speed was derailed by a rock which had fallen upon the track, and the engine and 15 loaded cars fell into the Susquehanna River. Seven trainmen were injured.

And 5 others on 5 roads, involving 2 passenger and 3 freight trains.

#### UNEXPLAINED.

4th, on Savannah, Florida & Western, near Jacksonville, Fla., a passenger train was derailed and a sleeping car overturned. Six passengers and one trainman were injured.

4th, on Norfolk & Western, at Breeden, W. Va., the engine and 15 cars of a freight train were derailed and wrecked.

4th, on Norfolk & Western, at Patrick, W. Va., a wrecking train was derailed and 5 employees were injured, one of them fatally.

8th, 2 a. m., on New York, New Haven & Hartford, near Port Morris, N. Y., a locomotive was derailed and fell down a bank. The engine-man, fireman and one brakeman were killed.

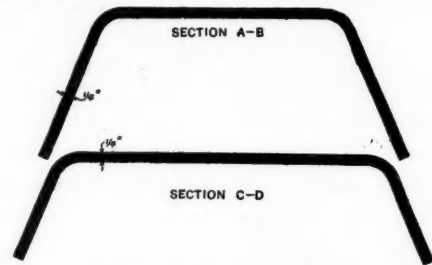


Fig. 3.—Sections of Steel Tie.

10th, on Norfolk & Western, near Welch, W. Va., the engine of a passenger train was derailed and fell into the river. One employee was killed and 2 injured.

12th, on Southern Railway, at Thicketty, S. C., a freight train was derailed and 12 cars were wrecked. The engine-man was killed.

12th, on Baltimore & Ohio, at Sykesville, Md., a freight train was derailed and one car fell upon the adjoining track, where it was run into by another freight. The fireman of the latter train was injured.

12th, on Pennsylvania road, at West Philadelphia, a caboose was derailed and ran against a passenger train which was passing on an adjoining track, badly damaging the passenger engine. The engine-man was fatally injured.

12th, 8 p. m., on Philadelphia & Reading, at Norristown, Pa., a passenger train was derailed at a switch and 2 passenger cars were overturned. Four passengers were injured.

14th, on Lake Shore & Michigan Southern, at Salem, Pa., a freight train was derailed and several cars were ditched. Three trainmen were injured, one of them fatally.

18th, on Norfolk & Western, at Dunlow, W. Va., a

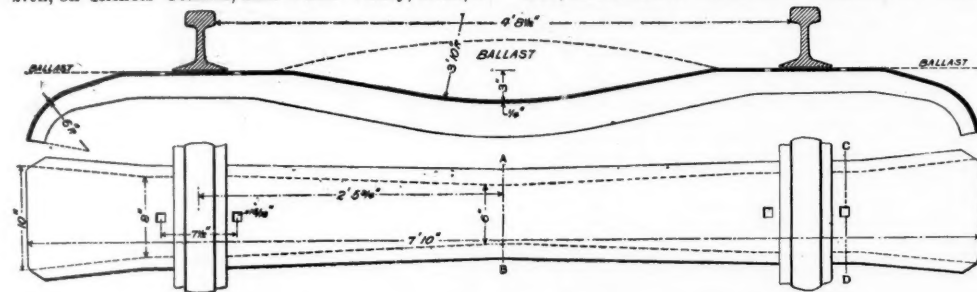


Fig. 2.—Improved Form of Hartford Steel Tie, Used on the New York Central Railroad.

passenger train was derailed by a broken rail and the express messenger was injured.

And 4 others on 4 roads, involving 4 freight trains.

#### DEFECTS OF EQUIPMENT.

22d, on Pennsylvania road, at Princeton Junction, N. J., the locomotive of a freight train was wrecked by the explosion of its boiler and several freight cars were derailed. The engine-man was killed.

And 16 others on 15 roads, involving 1 passenger train and 15 freight and other trains.

#### NEGLIGENCE IN OPERATING.

23d, on Metropolitan Elevated, Chicago, an electric motor car became uncontrollable at Forty-eighth street and ran over a bumping post and fell to the street below. The conductor, motorman and one passenger were injured. It is said that the motorman was asleep and failed to apply the brakes at the proper time.

And 4 others on 4 roads, involving 4 freight trains.

#### UNFORESEEN OBSTRUCTIONS.

14th, on Union Pacific, Denver & Gulf, at Denver, Col.,

freight train was derailed and 9 cars fell down a bank. Three trainmen were injured.

24th, on New York, New Haven & Hartford, at Central Falls, R. I., a freight train was derailed and one tramp injured.

25th, on Cleveland, Cincinnati, Chicago & St. Louis, at Milford, Ind., 13 cars of a freight train were derailed and fell through a bridge into the river. Two trainmen were injured.

And 21 others on 21 roads, involving 2 passenger and 19 freight and other trains.

#### OTHER ACCIDENTS.

13th, 5 a. m., on Atchison, Topeka & Santa Fe, near Newton, Kan., the heater in a passenger car in a moving train exploded, injuring 5 passengers. It is said that the safety valve was found after the explosion to be in good condition.

20th, on Denver & Rio Grande, near Wigwam, Col., the engine of a passenger train was wrecked by the breaking of a parallel rod and the engine-man was fatally scalded.

tion and an empty passenger train backing out, doing slight damage. Several passengers were slightly injured.

7th, on Texas & Pacific, between Plaquemine, La., butting collision between a passenger train and a freight, making a bad wreck; a tramp was killed, freight engine-man fatally injured and one brakeman injured.

11th, on West Virginia Central & Pittsburgh, near Cumberland, Md., collision of work trains, injuring several employees, one fatally.

11th, on Union Pacific, near Dana, Wyo., butting collision between a freight train and an empty engine, the latter having run past a meeting station, contrary to orders. Both firemen were injured.

12th, on Iowa Central, near Peoria, Ill., butting collision of freight trains on a bridge; 1 engine-man killed and 1 fireman injured.

12th, on Buffalo & Susquehanna, at Cherry Springs, Pa., butting collision of passenger trains, badly damaging both locomotives. Five employees were injured, 1 of them fatally.

16th, on Illinois Central, near Jackson, Tenn., 5 cars escaped from a freight train which was switching in the yard and ran out some distance on the main track and met a freight train on a trestle, making a bad wreck. A brakeman was killed and the engine-man was badly injured.

20th, 4 a. m., on New York Central & Hudson River, near Horseshoe Point, N. Y., butting collision between a passenger train and empty engine; the passenger engine was killed, and the other engine-man and 1 fireman were injured. It is said that the empty engine was running on the time of the passenger train.

21st, 7 a. m., on Philadelphia & Reading, near Frankford, Pa., butting collision of passenger trains, wrecking the foremost cars of both trains and killing 2 passengers. Twelve passengers were injured, 1 fatally. The south-bound train left Frankford in violation of the time-table rule.

23d, 3 a. m., on West Shore road, at Buffalo, N. Y., butting collision between switching freight trains, badly damaging both engines. A man riding on one of them was badly scalded.

23d, on Cincinnati, New Orleans & Texas Pacific, at Cardiff, Tenn., butting collision of freight trains, wrecking 5 locomotives and many cars. A tramp was killed and 4 trainmen were injured. A defective telegraphic order had been given to one of the trains.

26th, on Burlington & Missouri River, at Seward, Neb., a westbound passenger train ran into an east-bound freight, making a considerable wreck. A fireman was killed and 5 passengers and 1 trainman were injured.

26th, on Southern Railway, near Peyton, Ga., butting collision of freight trains, doing considerable damage. Both firemen and 1 brakeman were killed and one engine-man was fatally injured; 5 tramps were also hurt. One of the trains disregarded a telegraphic order.

30th, on Baltimore & Ohio Southwestern, near North Bend, Ind., butting collision of passenger trains, both running at considerable speed. Both engines and 3 baggage cars were wrecked. One fireman was killed and 2 passengers, 4 trainmen and 1 tramp were injured. The operator at Storrs reported one of the trains to the dispatcher as not having passed, when in fact it had. This operator is said to have been a temporary substitute.

31st, on Missouri, Kansas & Texas, near Clayville, Mo., butting collision between a freight train and a work train, wrecking both engines and several cars. Six employees were injured. The conductor of the work train misread his time table.

And 5 others on 5 roads, involving 1 passenger train and 9 freight and other trains.

#### CROSSING AND MISCELLANEOUS.

4th, on Lehigh Valley, near Geneva Junction, N. Y., a freight train backing a crossover was run into by a passenger train, wrecking a number of freight cars. The passenger conductor was injured and the freight engine-man was fatally scalded.

11th, on Pennsylvania, near Tiffin, O., collision of freight trains, wrecking 3 cars. One trainman was injured;



duplicate and the motors can be operated from either platform of the car. Each controller can operate the four motors or any two of them, as desired.

The power for switching is to be obtained from an overhead line. A special trolley, a modified form of the mining trolley, has been designed for this work. It operates in either direction without reversing, and remains in contact with the trolley wire at all times. Two will be used, one on each end of the car. An automatic circuit breaker is located on each end of the car within easy reach of the motorman.

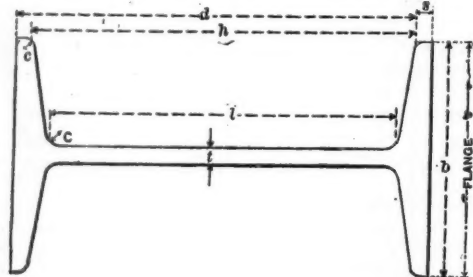
The trucks are of the same style used on the Chicago West Side Elevated Railroad and have the combined advantages of a passenger and locomotive truck. They are made by the McGuire Manufacturing Company, of Chicago. The increased weight of the car will be about nine tons, including trucks and electrical apparatus.

There are also 12 electric heaters located under the seats of the car. These heaters, made by the Consolidated Car Heating Company, of Albany, have a maximum capacity of 40 sq. ft. of radiating surface at 400 deg. Fahr. Five graduations of heat can be obtained by means of a controlling switch.

The entire car equipment is supplied and installed by the General Electric Company, of Schenectady, under the supervision of Mr. C. B. Martin, the company's assistant engineer. The car is to be run for 30 days under service conditions and removed, if not satisfactory, without expense to the trustees of the bridge.

#### Proposed Standard Structural Shapes.

The plan which was proposed some time ago for standardizing structural shapes was put into the hands of a committee by the Association of American Steel Manufacturers. Considerable correspondence has been going on concerning the proposed standards, and those suggested by the committee are shown herewith. We condense them from an article in the *Iron Age* of Jan. 9. The standards suggested are for I-beams and channels, and the accompanying drawings and tables fully describe them. As a basis a 6-in. channel is used and a 6-in. beam. Mr. Taylor, of the Carnegie Company, a



Section of Six-Inch Minimum Beam.

member of the committee, says that the minimum weight and sizes may be changed somewhat before their final adoption. In a 24-in. beam the minimum weight is 90 lbs. and the maximum weight 100 lbs. Its size will vary by 5 lbs. only, there thus being five sizes of 24-in. beams. The minimum weight of the 20 in. beam will be 64 lbs., the next 70, varying from there by 5 lbs. up to 100, and so on.

In rolling 12-in. beams Mr. Taylor says that they roll from 31½ lbs. up to 40 lbs. without changing rolls. From 40 lbs. to 55 lbs., the maximum weight, they change the rolls and these are special sections. This applies also to 15-in. beams from 60 to 80 lbs., being special sections, and to 26-in. beams from 80 to 100 lbs. At the present time 50 different sizes of angles are rolled. It is proposed to reduce this number greatly.

The formulae for the areas, weights, etc., are as follows:

Formula for area:

$$\text{Area} = t d + 2s(b-t) + \frac{(b-t)^2}{100} 16\%$$

Formula for weight:

$$\text{Weight per foot} = \text{area} \times 3.4$$

Formula for moment of resistance:

$$R = \frac{I}{d} \quad \text{Batter} = r = \frac{h-l}{2(b-t)}$$

$$I = \frac{1}{12} [b d^3 - \frac{1}{8} r (h^4 - l^4)]$$

$I$  = Moment of inertia, neutral axis parallel to flange.

Formula for area:

$$\text{Area} = t d + 2s(b-t) + \frac{(b-t)^2}{200} 16\%$$

Formula for weight:

$$\text{Weight per foot} = \text{area} \times 3.4$$

Formula for moment of resistance:

$$R = \frac{I}{d} \quad \text{Batter} = r = \frac{h-l}{b-t}$$

$$I = \frac{1}{12} [b d^3 - \frac{1}{8} r (h^4 - l^4)]$$

$I$  = moment of inertia, neutral axis parallel to flange.

$s$  = thickness of web =  $t$  for all channels and beams except 20", 1 and 24" I = 0.60". For 20" I = 0.55". For 24" I = 0.60".

#### PROPOSED STANDARD CHANNELS.

Depth.	Min. wt.	Inter. weights.	Max. wt.	Min. Fl.	Min. web.	Min. area.
In.	Lb.		Lb.	In.	In.	sq. in.
15	33.0	35 lbs., then vary by 5 lbs.	55.0	3.40	0.40	9.9
12	29.5	25 lbs., then vary by 5 lbs.	45.0	2.94	0.28	6.0
10	15.0	Vary by 5 lbs.	35.0	2.40	0.24	4.5
9	13.25	15 lbs., then vary by 5 lbs.	25.0	2.43	0.23	3.9
8	11.25	Vary by 2½ lbs.	21.25	2.26	0.22	3.4
7	9.75	Vary by 2½ lbs.	19.75	2.09	0.21	2.9
6	8.0	Vary by 2½ lbs.	15.5	1.92	0.20	2.4
5	6.5	Vary by 2½ lbs.	11.5	1.75	0.19	2.0
4	5.25	Vary by 1 lb.	7.25	1.58	0.18	1.6
3	4.0	Vary by 1 lb.	6.00	1.41	0.17	1.2

#### PROPOSED STANDARD BEAMS.

Depth.	Min. wt.	Inter. weights.	Max. wt.	Min. Fl.	Min. web.	Min. area.
In.	Lb.		Lb.	In.	In.	sq. in.
24	80.0	Vary by 5 lbs.	100.0	7.00	0.50	23.3
20	64.0	70 lbs., then vary by 5 lbs.	100.0	6.25	0.50	19.3
15	42.0	45 lbs., then vary by 5 lbs.	100.0	5.50	0.41	12.5
12	31.5	35 lbs., then vary by 5 lbs.	55.0	5.00	0.35	9.3
10	25.0	Vary by 5 lbs.	40.0	4.68	0.31	7.4
9	21.0	25 lbs., then vary by 5 lbs.	35.0	4.33	0.29	6.3
8	17.75	Vary by 2½ lbs.	25.25	4.00	0.27	5.2
7	15.0	Vary by 2½ lbs.	20.0	3.61	0.25	4.4
6	12.25	Vary by 2½ lbs.	17.25	3.33	0.23	3.6
5	9.75	Vary by 2½ lbs.	14.75	3.00	0.21	2.9
4	7.5	Vary by 1 lb.	10.5	2.66	0.19	2.2
3	5.5	Vary by 1 lb.	7.5	2.33	0.17	1.6

#### Electric Traction on Trunk Lines.

The "Verein für Eisenbahnkunde" (society for railroadography), in Berlin, had discussions on electric traction on trunk lines on Nov. 12, 1891; again on the same date in 1893, and again in 1895. This time Mr. Leissner read the paper, which is condensed below from *Glaser's Annalen*.

The results of the past two years for electric traction on trunk lines are rather negative, inasmuch as some mistaken notions have been corrected by experience and misdirected efforts have been recognized as futile.

The hopes of attaining unusually high speeds are shattered and several projects fell flat because existing railroad lines are not adapted for operation at speeds of 150 miles an hour. Specially built roads for high speed passenger, mail and express service cannot be made to pay. Our generation will not see such schemes revived.

The conviction has become general, that the introduction of electric traction on trunk lines is possible only if it neither impairs the usefulness nor prohibits the use of that which now exists.

The dissolution of train service into a single car service is impracticable on lines of dense traffic; it would not increase but reduce their efficiency. Nor is it compatible with the safety of operation to distribute motor cars throughout the length of a train of trailers, either passenger or freight. We can, therefore, only replace the steam locomotive by an electric locomotive, leaving everything else as it is.

There are two kinds of locomotives: (1) the storage battery locomotive and the Heilmann locomotive; (2) dependent locomotives continually taking power. The speaker condemned the independent ones. The results obtained with dependent ones at Baltimore, Nantasket and Mount Holly are encouraging, though far from satisfactory. Only a small fraction of the power produced at the central station is realized as drawbar pull. This defect will partly be remedied by improvements in details and methods; partly it is inherent.

At high speeds direct-current motors work to best advantage. Eighty-five per cent. of the power delivered

intervals,  $0.80 \times 0.85 \times 0.90 = 61$  per cent. of power developed at the power station. The best stationary multi-expanding condensing engines seem to yield 1 H. P. hour from 1.75 lbs. of coal. A horse-power hour at the drawbar is therefore obtained: with frequent

stops at  $\frac{1.75}{0.38} = 4.6$  lbs.; with distant stops at  $\frac{1.75}{0.61} = 2.87$  lbs. of coal, in the latter case according to *Railroad Ga-*

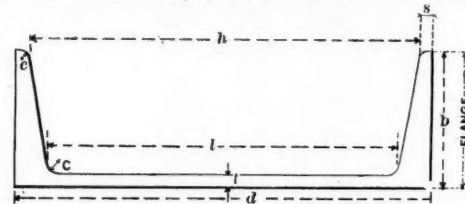
*zette*, 1894, page 489, more likely from  $\frac{1.75}{0.50} = 3.5$  lbs. of coal.

Well built compound locomotives consume on not too short runs about 24 lbs. of steam per horse-power hour. For an evaporation of 6, therefore,  $24 \div 6 = 4$  lbs. of coal, rising to 5 lbs. for short runs per horse-power hour, are consumed. Consequently there is not much to be gained by a change.

But coal consumption is only one item in the economical balance sheet. First cost, interest and depreciation, cost of reserve power and reserve parts, cost and maintenance of power and rolling stock, have all to be considered.

The great first cost of the many power stations needed for long lines with dense service will prevent a change of motive power at the present state of the electric art. Not less than 10 per cent should annually be written off with a view to keeping up with improvements. Reserve requirements will be less with electric than with steam service. Cost of maintenance will also be in favor of electric operation. The reliability, regularity and safety of electric operation cannot be gainsaid.

To date the experiments on steam railroads are limited to short branches; the equipping of trunk lines has not



Section of Six-Inch Minimum Channel.

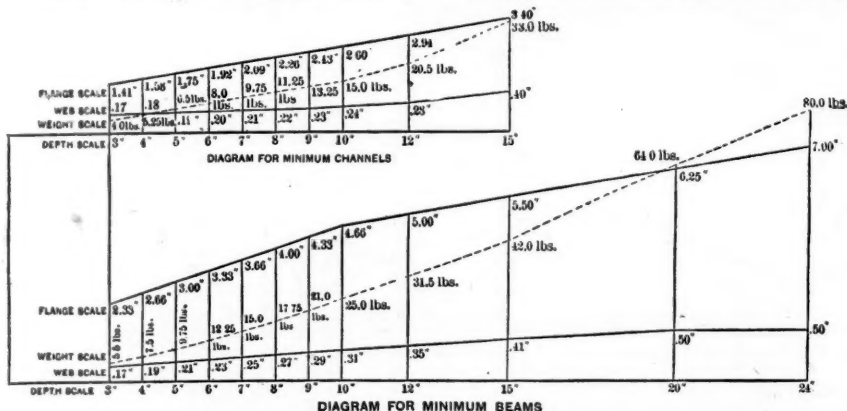
yet been attempted for economical and technical reasons. But the variable requirements of a dense and complicated service offer also grave problems. At certain hours of the day there will be only one to two trains on the line, at others .0 to 30 at a time, and the weight of freight trains is subject to considerable variation. Again, there is the convention, sport and excursion traffic, military transports, encumbering lines to their utmost capacity, but for a few days only. In such emergencies train service with steam locomotives offers not the least difficulty. It is only necessary to concentrate the locomotives from neighboring sections to the particular spot.

It would be unreasonable to adopt the electric installation to such rare, though regularly recurring, requirements. Locomotive traction will remain the only possible solution for such conditions. The electric requirements must therefore not impede the present steam service.

The solution of the electric long-distance service problem must be expected from the development of the alternating current apparatus.

#### Chicago Elevated Roads.

*The "Alley" Elevated.*—The annual meeting was held Jan. 20 and the annual report was presented. The interest on the bonded indebtedness, amounting to \$525,000 for 1895, has been defaulted, and Oct. 5 the road passed



(Beams and Channels will be cut to lengths with extreme variation not exceeding 1½ in. Any cutting to less variation will be charged ½ cent per lb. extra.)

to the motor is then realized on the drawbar. The percentage is brought down by variations of the speed of the car. For urban and suburban service, with stops in distances of 1,000 to 1,500 ft., no more than 60 per cent., even 50 per cent. only, is realized; where runs of not less than say 6 minutes at full speed can be made about 80 per cent. may be expected. Again, if at the power station 85 per cent. of the indicated power of the steam engine is obtained at the generator terminals, and if the efficiency thence to the motor terminals is 90 per cent., there is realized as drawbar pull: For stops at short intervals,  $0.50 \times 0.85 \times 0.90 = 38$  per cent.; for stops at long

into the hands of a receiver, Mr. Marcellus Hopkins (the President) being appointed. In 1893 the State Board of Equalization placed the value of the property at \$200,000 per mile, which was considered far in excess of its real value. In 1894 taxes were paid to the amount which was considered just and the remainder were contested. This led to costly litigation and a remission of a large part of its balance was obtained. The amount still due, together with the legal expenses, was paid out of the earnings of 1895, when in reality it should have been charged to 1894. This made the operating expenses higher, their percentage with respect to earnings being

75.5 per cent. Deducting these legal expenses and taxes before mentioned will bring down the percentage to 71.0.

Earnings: \$710,857.02  
 Passenger 33,910.48  
 Other sources 33,910.48

Total \$744,167.50  
 Expenses: Maintenance of way and structure \$37,190.45  
 " " rolling stock 33,906.46  
 Conducting transportation 357,115.10  
 General expenses 85,192.84  
 Taxes 46,680.08  
 Total 560,384.93

Net earnings and receipts 183,782.57  
 Interest on funded debt 525,000.00  
 Deficit, 1895 311,217.43  
 " 1894 56,693.37

Deficit Dec. 31, 1895 \$397,910.80

Traffic working: Train mileage 1,110,138  
 Car 4,243,208  
 Passengers carried 11,218,004  
 Average cost per passenger \$0.0394  
 Operating expenses (total) per train mile .5047  
 " " " " " " .1320

A comparison of these figures with the 1894 report, published in the Railroad Gazette of Feb. 1, 1895, shows a

two terminals and at Forty-third street. It is hoped that the Union Loop will be completed before another year and this will completely change the distribution. It will also increase the number of passengers carried.

Below is given a table of average daily expenses; a more detailed one was published last February in the Railroad Gazette.

Maintenance of way and structure 1895 \$101.90 1894 \$116.96  
 Maintenance of rolling stock 92.89 73.90  
 Conducting transportation 979.22 1,111.93  
 General expenses 361.29 254.81

Total \$1,535.30 \$1,557.70  
 Per cent. of expenses and taxes 75.5 81.2  
 Per cent. of expenses not including taxes 69.0 78.8

Lake Street.—The second annual meeting of the stockholders of the Lake Street Elevated took place Jan. 14. Since the last annual meeting the Wabash avenue extension has been completed and was opened for traffic Sept. 23, and the good effects of a better down-town terminal have been seen from the increased traffic for the last three months of the year. The Humbolt Park line has been given up, and the real estate purchased for this

Operating expenses: Maintenance of way and structure \$5,894.19  
 " " " " equipment 17,672.89  
 Conducting transportation 115,755.81  
 Motive power 135,086.25  
 General expenses 43,247.15

Total \$319,606.29  
 Net earnings 197,698.47  
 From Union Loop Co.'s share of general expenses in Wabash avenue extension 29,600.00

Total \$327,298.47  
 Fixed charges \$265,416.94

Deficit for 1895 \$38,148.47  
 " 1894 165,169.96

" Dec. 31, 1895 \$203,308.43

Traffic working: Train mileage 960,498  
 Passengers carried 9,936,450  
 Average cost per passenger \$ .0322  
 Operating expenses per train mile .3327

The percentage of operating expenses to gross earnings was 61.78. The contract has been let to equip the road with electric motive power, using the third rail system. No power house will be built; the current is to be furnished by the West Chicago Street Railroad Company for 10 per cent. above actual cost. It is believed that with this equipment the percentage of the operating expenses will be reduced to 45.

### European Express Train Speeds.

In discussing the special train of Oct. 24, 1895, over the Lake Shore & Michigan Southern, which ran 510.1 miles, at an average speed of 63.61 miles an hour, the "Journal of the Austrian Engineers' & Architects' Society" contrasts the speed actually made by European express trains and makes up the following table:

Route.	Time consumed.	Distance, miles.	Average speed, miles per hour.	Difference in standard time.
1. London-Edinburgh, via York, Newcastle	7:30	397.5	53	.....
2. Berlin-Hamburg	3:36	178.75	49.65	.....
3. Paris-Lyons	7:28	320	42.86	.....
4. Dublin-Queenstown	4:15	178.75	42.06	.....
5. Paris-Bordeaux	8:42	365.62	42.02	.....
6. Vienna-Budapest	4:13	173.75	41.20	.....
7. Vienna-Eger, Karlsbad Express	6:50	285	41.36	.....
8. Berlin-Alexandrow (Russian frontier)	6:14	250.62	40.20	.....
9. Berlin-Vienna, via Breslau, Oderberg	12:47	491.25	38.43	.....
10. Berlin-Cologne, via Magdeburg, Braunschweig	9:32	360	37.83	.....
11. Vienna-Lemberg	13:00	471.9	36.30	.....
12. Ostende-Vienna, via Brussels and Cologne	23:35	825	35.40	60 min.
13. Paris-Vienna, via Strasbourg and Karlsruhe; Orient Express	24:05	841.62	31.87	55 min.
14. Paris-Madrid; South Express	28:33	907.5	31.78	20 min.
15. Vienna-Nice, via Venice and Milan	29:47	844.38	28.31	55 min.

Items 6 and 7 are taken from last summer's time tables; all the others from this winter's.

### Tunnel for the Boston Water Supply.

The elaborate system of water works now in course of construction for supplying the city of Boston and smaller towns within a radius of 10 miles of it, includes the aqueduct which will carry water from the Nashua River reservoir to the distributing reservoirs near the city. This reservoir is about 50 miles from Boston. Proposals for sections 2 and 3 have been advertised for. These sections include a tunnel 11,319 ft. long. The grade is 1 ft. in 5,000 for part of it and 1 ft. in 2,500 for the rest. The greatest distance from the bed of the tunnel to the surface is about 250 ft. The route of the tunnel is nearly straight, though a slight change of direction is made at shaft No. 3, and again at shaft No. 4. At the portal, in Berlin, another change in direction is made as the open trench is reached. The tunnel will vary in height from 10 ft. 6 in. to 10 ft. 10 in. Its width at widest point will vary from 12 ft. 2 in. to 13 ft. 6 in. The material of which it will be built will vary according to conditions of the earth through which it shall pass.

To give some idea of what remains to be done on this system of water supply the following items of work are in prospect: A masonry dam is to be built across the Nashua River; about 5,500,000 cu. yds. of soil are to be removed from 6½ sq. m. of territory; large dikes are to be built; 6½ miles of railroad and 19 miles of ordinary roads, to be flooded by the reservoir, will have to be relocated, which will involve the construction of some expensive bridges. The total estimated cost of this reservoir and dam is \$9,000,000. The preparation of the plans and specifications for the reservoir and dam may be completed in time to make contracts next autumn or in the spring of 1897.

### New Snow Sheds.

Considerable trouble has been caused by snow slides at the Gunnison end of the Alpine Tunnel, on the Denver, Leadville & Gunnison Railroad. On Dec. 23 a snow slide occurred which stopped all traffic through the tunnel for two weeks. It is reported that the company will build snow sheds protecting the road for a distance of three miles from the tunnel. Some of the material is already on hand and work will be begun when the weather permits. It is near this place that the town of Woodstock once stood, which was destroyed by an avalanche.

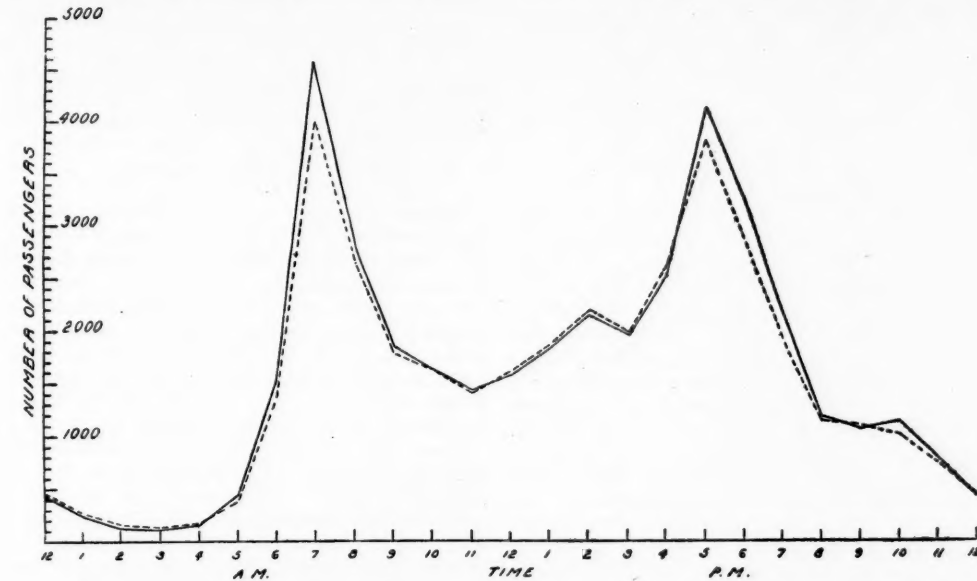


Fig. 1—Average Hourly Traffic—"Alley" Elevated Railroad.

Full line shows results for 1895; dotted line for 1894.

decrease of 120,000 train miles and 940,000 car miles, an increase of 630,213 in the number of passengers, a small decrease in the average cost per passenger and a small increase per train mile. The road was operated at a loss, including interest, of \$934.82 a day against \$1,046.23 for 1894.

No change has been made in the road during the year, the proposed extension to Englewood being dropped.

In order to show the growth of traffic on the road during the year diagrams have been prepared. Fig. 1 shows the average hourly traffic on the road for the year, the

purpose is now being sold. The terminal at West Fifty-second street is being improved by building a large station equipped with two elevators.

At the last annual meeting a committee was appointed to confer with the bondholders for the purpose of adjusting and settling on some compromise in order to avoid foreclosure of the mortgage under which the bonds were issued. The plan agreed on by the committee was to scale down the bonds to 60 per cent. and issue income bonds, representing 15 per cent. of the face value of the bonded indebtedness, to replace the canceled 40 per cent.

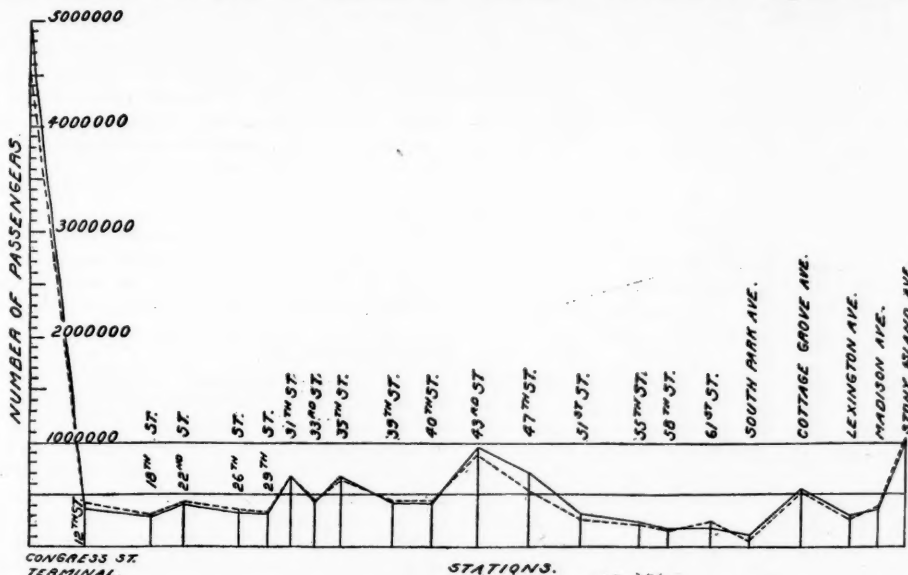


Fig. 2.—Tickets Sold at Stations on the "Alley" Elevated Railroad.

Full line is for 1895; dotted line for 1894.

hours being shown by the abscissas and the number of passengers by the ordinates. The full lines show the results for 1895, and the broken lines the same for 1894. The highest average, which is from 7 to 8 a. m., has been increased from 3,996 to 4,545.

Fig. 2 is a comparison between the total number of passengers purchasing tickets at the different stations during the years 1894 and 1895. The full lines, as before, show those for 1895 and the broken for 1894. The general form of the diagram is the same as that for last year, the greatest number of passengers taking the trains at the

If the earnings of the company were sufficient to pay 5 per cent. on the 60 per cent. of the bonded indebtedness, then the next earnings would go to pay 5 per cent. on the income bonds. Out of \$7,473,000 bonded liability, \$6,574,000 have agreed to this plan. The remainder, \$899,000, it is hoped, will eventually agree. The earnings and expenses were as follows:

Earnings: Passengers \$496,776.61  
 Miscellaneous 20,523.15  
 Total \$517,304.76



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#### EDITORIAL ANNOUNCEMENTS.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

A great obstacle to the progress of the reorganization of the Northern Pacific has been removed by a decision just reached and announced by the Justices of the United States Supreme Court. Each Justice has sent to the Circuit Court to which he is assigned—these being the second, seventh, eighth and ninth—an order that in respect to the proceedings for foreclosure the Circuit Court for the Eastern District of Wisconsin will be regarded as the Court of primary administration, and that the other Circuit Courts shall be ancillary in their character. At the same time, each Circuit Court reserves the right to make such orders as shall seem just for the protection of creditors within its jurisdiction. Justices Field, Harlan and Brewer united in signing a memorandum sustaining this view, but Justice Brown signed a special memorandum to the effect that in his opinion the Circuit Court of the district of Minnesota should be treated as the Court of primary administration. As the whole object of the action is to secure harmony throughout the region in which the property is situated, he waives his personal views in deference to the opinion of the other Justices and accedes to the recognition of the Wisconsin court as that of primary jurisdiction. The three Justices who express themselves as in favor of the superior authority of the Wisconsin court justify this opinion on the ground that a portion of the line of the Northern Pacific is within the State of Wisconsin, and that when proceedings were begun the Northern Pacific was operating its road through the Eastern District of Wisconsin and that the jurisdiction of the Wisconsin court has been recognized by the Circuit court in every district along the line of the Northern Pacific, and by all parties, for about two years. They would not be understood, however, as passing on the proposition advanced, that it is competent for a Circuit Court of the United States, by consent of parties, to foreclose the mortgage of a railroad no part of which is within the territory of jurisdiction of such court. This action of the Justices clears the ground and it may be expected that the re-organization of the Northern Pacific will now go rapidly forward.

#### Concerning a City Engineer.

About the last place to begin to economize in the administration of a modern city is in the engineering department. This is assuming that department to be already under a competent and honest man. The whole year's expenditure for strictly engineering work is such a small percentage of the total expenditure for building, maintenance and repairs that it may easily disappear in comparison with the effects of one mistake in judgment or with the results of one year of insufficient or incompetent inspection. The instances which go to prove these statements are so numerous and recur so often that one would suppose that they would be plain even to the most "practical" alderman, and yet we must not expect too much of the city rulers. It happens once in a while that they come to know of a costly mistake made by an engineer or of carelessness or extravagance in the

administration of an engineer's office, and we cannot expect them to discriminate very accurately as to causes and effects. The engineer therefore must be prepared to slowly and patiently educate his public, and to do this not only by strict attention to duty in that station in life unto which it shall please God to call him, but by public defense of his own work and of the work of his fellow engineers. And it is not altogether unwholesome that engineers engaged in municipal work should be obliged to justify themselves sometimes before the public. Engineers are a singularly faithful and honest body of men, but they are often subject to peculiar temptation to become bureaucratic, and not many worse things can happen to a man than that. It is therefore good for them, even if it is annoying, to be stirred up once in a while and made to account for themselves. We could mention a good many instances of departments, not alone in city work either, where a placid security from investigation has resulted, not in corruption or in a low sense of duty, but in that sort of fossilized inefficiency which we may call bureaucracy.

All of these generalizations are suggested by an incident which has recently come to our notice from St. Paul, Minn. It appears that a retrenchment committee, looking about for places to economize, made a report implying extravagance in the department of the city engineer, Mr. L. W. Rundlett, M. Am. Soc. C. E. The Civil Engineers' Society of St. Paul appointed a committee to investigate the grounds of this report and to report to the society the results of the investigation. The committee consisted of Mr. C. F. Loweth, consulting engineer, M. Am. Soc. C. E.; Mr. A. O. Powell, civil engineer in the employ of the Engineer Bureau of the U. S. War Department, and Mr. John D. Estabrook, engineer and secretary of the C. C. Washburn Milling Co. This committee made a very careful examination of the affairs of the department. Several days were spent in the investigation. The books of the engineer's office were thoroughly overhauled; one session of the committee lasted twelve consecutive hours; and altogether the job seems to have been pretty thoroughly done, and we may be sure it is not a job of whitewashing.

The committee undertook to ascertain if the bureau was efficiently and economically organized; if the work was efficiently done and records properly kept; whether the cost of the bureau can be reduced. The organization of the bureau consists of a City Engineer, four assistants and the necessary clerks, instrument men, etc. The assistants have specialized sub-departments; that is, one of them has charge of sewers and streets, one of bridges and water-works, one of the office work, and one of the surveys.

The average annual cost of the work done under this department in the three years, 1893, 1894 and 1895, exclusive of engineering and inspection, was \$467,707, of which more than half was for construction, and \$200,000 was spent for maintenance, street sweeping and sprinkling. The cost of engineering and inspection was \$34,506; that is, engineering was 7 per cent. of the whole. To ascertain whether or not this was an unreasonable percentage, an examination was made of a large number of reports of city engineers from various cities and of the engineering expenditures of various railroads. From the city reports it was found that the percentage chargeable to engineering varied from 4 per cent. to 9 per cent. of the total work done, but so far as could be discovered the low percentages did not include the cost of inspection. Inquiry from the Chief Engineer of one large railroad brought out the fact that in field engineering the percentage of engineering cost was 2.1 of the total. This did not include any portion of the salary of the Chief Engineer or any of the permanent office expenses. Another Chief Engineer of a large road gave it as his experience, after many years of observation on this very point, that the total cost of all engineering on railroad work varies between 4 per cent. and 6 per cent. The engineering work of the city of St. Paul is assumed to be fairly comparable with that of a railroad 3,000 miles long, and one Chief Engineer consulted was of the opinion that the engineering charge on a railroad of that length would reasonably be \$36,000—a little more than the average engineering charges in the city of St. Paul.

The committee is of the opinion that the general character of the work of the bureau is creditable to the city and its engineers, and as to salaries, so far as the committee can judge, the City Engineer has not been paid a higher salary than similar responsibilities and qualifications would command in a majority of cities and in private interests. The "moral, mental and educational qualifications of the competent city engineer are as great and should command as high a price as those of any other county or municipal officer. The salaries of the four assistants are not as great as those paid in most cities or in private work for similar qualifications and responsibilities, and the

city is to be congratulated if it can retain its engineering force at the same salaries as in the past."

The committee is of the opinion that the engineering of the city of St. Paul is economically performed and it expresses the further opinion that in view of the work now before it the bureau should not be reduced; that such a reduction would ultimately be bad economy. Moreover, from an acquaintance with engineering offices, public and private, in many parts of the country, and from a minute acquaintance with the work and records of the City Engineer's office in St. Paul, the committee reports that it knows of no similar office where the work is more efficiently done and the records better or more comprehensively kept. We cannot bring this short synopsis of the report to an end in any better way than by quoting the following words of the committee:

"The retention of competent professional services, rather than the employment of 'a few honest and diligent men of average attainments,' is essential for true economy. Faulty design, or a misconception of the situation, would cost the city thousands of dollars. Critical knowledge of a vast amount of detail is necessary. It would be impossible for an engineer, skilled in other branches of his profession, but unfamiliar with municipal work, to successfully perform many of the simple duties of the City Engineer or his subordinates."

#### Control of Railroad Building.

The New York State Railroad Commission has recently decided a case not very important in itself, but of considerable importance as an application of certain sound principles of government regulation of railroads. It has denied the application of the Kings, Queens & Suffolk Railroad Company (Boytton Bicycle) for a certificate permitting the company to build its road. The project was to build from the Kings County Elevated, at the Brooklyn city line, as far east as Freeport and Hempstead; although we believe the immediate proposition was to construct only as far as the village of Far Rockaway. This is the Boynton "bicycle" scheme which has been before the public for a number of years. The proposition was to build a railroad which should embody the ultimate logical conclusion of the narrow gage idea. The wheels, drivers and carriers were to run on one rail. Horizontal wheels were to bear in guides overhead to keep the cars from falling over. If the decision of the Commissioners has the effect of burying this mechanical vagary it will justify all the expense of maintaining the Board for some time. The money of investors will be saved for better uses, and the energies of inventors and promoters will be set free for work that may be of value to the world.

The application is denied on the one sufficient legal ground that the company has not complied with the law in having paid in 10 per cent. of its capital in cash; but the Board reviews somewhat certain other considerations which would have prevailed if this first technical one had not been sufficient. It is of the opinion that there is no necessity for the construction of the road. The territory and population are now sufficiently supplied with railroad facilities. The terminal points of the proposed road are connected by two railroad lines, forming a part of the Long Island Railroad Company's system. As a matter of course the argument was made that existing rates of fare are unreasonable and that the applicant would give better and cheaper service. The Board accepts neither of these arguments. The legislature has now full power to regulate fares on existing railroads, and it does so under laws that are not unduly favorable to the railroad companies. If the present rates on the Long Island Railroad are unreasonable they can be reduced.

The promise of the applicant to reduce the cost of transportation, and also to reduce the rates to be paid by customers, has no binding quality. The new road would be subject to the action of existing laws as the old roads are, and fares on it could be regulated by the law, regardless of the will of the owners. The new company must charge what the service is worth, and if it charges less it will become bankrupt, and bankrupt companies are not desirable. Manifestly, the applicant promises to bring about results which could be brought about by other agencies, or it promises to do what business principles declare to be impracticable. Therefore, the Board feels justified in stepping in to protect the various interests; that is, the old and new investors and the public in the territory in question.

The Board considers the statement that the territory which the applicant desires to serve is now subject (in transportation matters) to a monopoly. To this it is replied that the railroad companies of the state are not monopolies; they are as far from the condition of monopolies as freedom of construction in the past and thorough legal supervision in the present can make them. It is suggested indeed that

the railroad service of the state would, in some particulars, have been better than it is if investors had had more legal protection.

This is not the first time that the New York Commissioners have used their prerogative in this way. Several times in the last few years they have denied applications from companies wishing to build new railroads on the ground that there was no public necessity for those roads. In looking over the list of applications one cannot feel that the Commission has erred on this side. The number of applications denied is proportionately very small, and among those granted are many for projects which it would probably have been better to kill in their very early stages. In this country the whole tendency is for Railroad Commissioners to interpret a doubtful case in favor of the applicant for the privilege of building a new road. We are only emerging, and that slowly, from the theory of unrestrained competition and considering all things it is probably wise that the State Commissioners should use very carefully their powers to stop the building of unnecessary roads. It is part of their duty to consider the public temper and to consider that they must slowly educate the public to more correct views on this subject. Nevertheless, we are inclined to think that it would be well if the power of veto were oftener used, and there are many reasons for thinking that the extreme difficulty with which new railroad companies get their rights from the English Parliament has been an excellent thing for the English railroads and the English people. We do not feel at all certain that the heavy Parliamentary expenses about which people talk so much have not been money well spent. The difficulty of getting a Parliamentary charter has prevented waste of new investments and has given stability to old investments, and has made it safe to spend sums in improving the facilities of existing lines which could not have been justified if the ownership of those lines had been more precarious.

In the last three or four years investors have been protected by quite another influence than State Commissioners and by an influence much stronger and of wider effect. The influence of which we speak is the growing knowledge and conservatism of the men who control capital. It has been increasingly difficult to raise large sums for building new railroads. This has been partly because those who had money to invest have learned the risks of this kind of investment, and partly because the men who largely guide opinion as to new railroad investments have been more and more prudent and unanimous in discouraging superfluous roads. And, after all, it is in the growth of popular wisdom that our greatest security against unwise expenditure must lie; but still there is great room for the influence in this direction of the public officers who are entrusted with the interests of the people at large and of the railroad companies, and every indication that those officers have the intelligence and the courage to take something more than a merely popular view is encouraging for the future.

In the case of the "bicycle" road there was a peculiar reason why it should not have been built. It was based primarily not on the pretense of the need of greater facilities, but on a novel and fallacious idea. The original idea was that great expense could be saved in right of way, track construction, rolling stock and operation by reducing the track to one rail, and it was claimed that this was possible by the use of what was supposed to be the principle underlying the bicycle. This principle is that a body moving swiftly in a vertical plane will stand erect as long as it is kept in motion, and that the swifter it moves the more stable it will be. As time has gone on, however, and a great many people have learned to ride bicycles, it has become a matter of popular knowledge that the bicycle does not stand up in virtue of any such principle, but that it stands up just as a boy balances a cane on his thumb. When it tends to fall on one side the thumb (forward wheel) is moved to that side, thus bringing the support again under the center of gravity.

It is queer that anybody should ever have supposed that a railroad car or a railroad train could be made to stand erect on one leg merely by moving it swiftly forward in a vertical plane. It could not happen once in a thousand times that the car or train would move in absolutely still air or with a wind dead ahead or dead astern, and a very little excess of wind pressure on one side of the moving body would incline it. Those of us who have watched a disk rolling on its edge—and most of us have seen this phenomenon hundreds of times—know that when the unfortunate train began to incline ever so little its fall would be very prompt. It would immediately begin to describe a curve in the direction of the inclination, and the greater the speed at which it was going the swifter and more disastrous would be its fall to the ground.

So the "bicycle principle," as applied to the Boy-

ton plan, appears to have been abandoned except for promotion purposes, and overhead guide rails have been adopted. Now it is claimed that inclosing the train between these guide rails and within the supports necessary to hold them up converts train and railroad into something like a projectile and a gun. "The bicycle may be compared with the barrel of a gun and the train with the bullet. The bullet cannot leave the barrel until it reaches the muzzle. We defy anyone to remove the bicycle cars from our structure without taking the structure apart. Eliminating, therefore, the possibility of the car leaving the track, we have only to provide against the possibility of collisions." We suspect that most railroad men will fail to see the analogy between the gun and the bicycle railroad. If the bicycle car or train were run at the speeds claimed for it a derailment within this structure would be more disastrous than a derailment in the open. The result would be to smash the cars against the posts and to bring down train and structure in a very bad wreck. Most of us would rather take our chances at 60 miles an hour on an open right of way with no posts alongside.

Of course many other claims are made for the bicycle construction. Great stress, for instance, is laid on the reduction of the percentage of dead weight carried, and figures are published showing how great this percentage is in the case of ordinary steam railroads and how small it might be made by the proposed construction. No mention is made, however, of the fact that the bicycle road would necessarily be essentially a passenger road. It could not, in the nature of things, carry a large volume of cheap freight; but for purely passenger roads we have the simple, efficient and well-tried "trolley" road, where the percentage of dead weight has been brought down pretty low, and which has the familiar advantages of commodious cars carried over two rails; and we cannot see that there is any call, either scientific or popular, for such a radical departure from well-tried methods as the one-rail system.

#### December Accidents.

Our record of train accidents in December, given in this number, includes 72 collisions, 79 derailments and 6 other accidents, a total of 157 accidents, in which 48 persons were killed and 199 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident, as reported, make it of special interest.

These accidents are classified as follows:

COLLISIONS:	Rear.	But-ting.	Cross-ing and other.	Total.
Trains breaking in two.....	9	0	0	9
Misplaced switch.....	2	0	1	3
Failure to give or observe signal.....	4	1	1	6
Mistake in giving or understand-ing orders.....	0	9	1	10
Miscellaneous.....	4	3	3	10
Unexplained.....	12	7	15	34
Total.....	31	20	21	72

#### DERAILMENTS.

Broken rail.....	3	Careless running.....	1
Loose or spread rail.....	3	Bad loading.....	1
Defective bridge.....	3	Bad switching.....	1
Defective switch.....	1	Snow on track.....	1
Defective frog.....	1	Landslide.....	4
Broken wheel.....	4	Wind.....	1
Broken axle.....	7	Malicious obstruction.....	4
Broken truck.....	2	Accidental obstruction.....	2
Fallen brakebeam.....	2	Unexplained.....	31
Broken car.....	1		
Boiler explosion.....	1		
Misplaced switch.....	2		
			79

#### OTHER ACCIDENTS.

Boiler explosion.....	1
Explosion.....	1
Broken side rod.....	1
Cars burned while running.....	1
Other causes.....	2
	6

Total number of accidents..... 157

A general classification shows:

	Colli-sions.	Derail-ments.	Other acci-d's.	Total.	P. c.
Defects of road.....	0	11	0	11	6
Defects of equipment.....	9	17	3	29	18
Negligence in operating.....	29	5	1	35	22
Unforeseen obstructions.....	0	12	2	14	9
Unexplained.....	31	34	0	65	45
Total.....	72	79	6	157	100

The number of trains involved is as follows:

	Colli-sions.	Derail-ments.	Other acci-d's.	Total.
Passenger.....	36	16	1	53
Freight and other.....	95	65	2	162
Total.....	141	81	6	228

The casualties may be divided as follows:

	Colli-sions.	Derail-ments.	Other acci-d's.	Total.
Killed:				
Employees.....	26	11	1	38
Passengers.....	2	0	0	2
Others.....	2	1	0	3
Total.....	32	15	1	48
Injured:				
Employees.....	42	39	3	84
Passengers.....	70	34	5	109
Others.....	7	1	0	8
Total.....	119	72	8	199

The casualties to passengers and employees, when

divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road.....	0	16	3	7
Defects of equipment.....	0	5	2	3
Negligence in operating.....	4	71	26	44
Unforeseen obstructions and maliciousness.....	0	5	1	14
Unexplained.....	0	10	9	16
Total.....	4	107	41	84

Thirty-four accidents caused the death of one or more persons each, and 30 caused injury but not death, leaving 98 (59 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with December of the previous five years shows:

	1895.	1894.	1893.	1892.	1891.	1890.
Collisions.....	72	66	84	107	125	82
Derailments.....	79	69	77	95	101	111
Other accidents.....	6	7	5	10	8	14
Total accidents.....	157	142	166	212	234	207
Employees killed.....	41	24	24	37	61	35
Others killed.....	7	5	7	4	23	18
Employees injured.....	84	89	110	119	172	104
Others injured.....	115	32	120	119	159	79
Passenger trains involved.....	56	58	64	84	73	80

Average per day:

Accidents.....	5.06	4.58	5.36	6.84	7.55	6.68
Killed.....	1.55	0.94	1.00	1.32	2.74	1.71
Injured.....	6.42	2.90	6.74	7.39	10.68	5.90

Average per accident:

Killed.....	0.31	0.20	0.18	0.19	0.36	0.25
Injured.....	1.27	0.63	1.25	1.68	0.41	0.88

It is somewhat startling to hear of a disastrous butting collision, involving a trainload of commuters, going to their work in one of the largest cities in the country, but that was the kind of accident which killed three of the four passengers reported as killed in our present record. This collision was on a single-track line of the Philadelphia & Reading, only a few miles out from the Philadelphia terminal. That no more persons were killed may be looked upon as great good fortune. Suburban trains everywhere are now made up so as to bring a carload of passengers immediately behind the tender, but in this case there was a baggage compartment occupying half the length of the forward car at its forward end. The explanation of the cause of the collision seems to be the old story; the conductor and engineman, instead of jointly bearing the responsibility, left it each to the other; one of them forgot and the other evidently didn't care.

The fourth passenger killed in December was a drover riding in a caboose. According to the reports, the engineman who demolished the caboose (and a good many cars in front of it) had some air-braked cars at his command, but he recognized the value of this additional protection simply by indulging in additional recklessness.

The butting collision at Preble, N. Y., was reported in the *Railroad Gazette* of Dec. 6, and that at St. Louis in the issue of Jan. 10. Another disastrous collision of passenger trains was that at North Bend, Ind. In this case the neglect of the operator was discovered before the collision occurred, but too late to prevent it. The anxiety of those possessed of the information was heightened by the fact that there was a possibility of stopping the west bound train before it met the other. A speculative reporter has figured out that there was an interval of three minutes in which to save the train by telegraphing to an operator on the Big Four road, which is located close to the line on which the collision occurred, and that telegraphic communication would have required only one repetition; but this expedient was not thought of in season.

The disastrous collision at Peyton, Ga., on the 26th, was due to the forgetfulness of two or more men. On the Metropolitan Elevated road in Chicago cars tumbled down into the street twice in December, but in each case there was only one passenger aboard, and no one was killed. At Ennis, W. Va., on the 4th, a freight train being pushed up hill by two engines became uncontrollable and ran back, killing three employees. In the collision at Milton, O., on the 16th, it is said that the passenger train approached the misplaced switch at 60 miles an hour, and the brave engineer is commended for his heroic efforts in applying the brakes so as to mitigate the force of the collision. While we have no wish to detract from the credit due this man, it is pertinent to ask the question why some one has not made a heroic effort to put in a distant signal at a place like that. Either the signal ought to be put in or the speed of trains ought to be less than 60 miles an hour. About 20 mine workmen were badly injured, two of them fatally, on a runaway train on the tracks of the Midvalley Colliery near Shamokin, Pa., on the 18th.

Street car accidents were numerous in December. We have accounts of 18, all of them on electric lines, injuring about 40 persons; but only two of the injuries were fatal. There were butting collisions at Paterson, N. J. (one killed); Medford, Mass.; Hoboken, N. J.; other collisions at Philadelphia and Chicago, in the latter of which a cable car was run into by an electric car; run-aways at Lancaster, Pa., Chicago, Norristown, Pa., and Pittsburgh. At Denver, on the 14th, a motorman ran his car in front of a passenger train, derailing the latter, and this accident appears in our record. Street cars got mixed up with steam locomotives also at Sioux City, Cleveland, Lorain, O., Toledo and Philadelphia.

Some months ago the New York, New Haven & Hartford ran an engine with two headlights placed on the smokebox side by side, and although the experiment was reported to be unsatisfactory, it appears that two engines—those used on the Air Line Flyer—are still

equipped in that way. The impression upon the observer, seeing such an engine approach at night, is as novel as that produced in the daytime by seeing an engine without a smokestack or without a tender; and the reporters get a considerable grist out of the episode by reason of the fact that the headlights are set "cross-eyed." This is so that the right-hand light will illuminate a curve turning to the left, and that the left-hand one will shine to the right. The degree of cross-eyedness is not stated. As the trains on which these lamps are used run about 50 or 60 miles an hour most of the time, we doubt whether the runner is able to distinguish objects 500 ft. ahead. If he can see farther than 300 ft., to any purpose, we shall be surprised. One good electric headlight would be worth a dozen common lights, either cross-eyed or straight-eyed. A man on the Southern Pacific at Duns-muir, Cal., lately rigged up a connection between the headlight of a locomotive and the truck, which was designed to turn the light whenever the engine was running on a curved track; and this tickles the reporters as much as the cross-eyed scheme; but we believe that it was found impossible to make an apparatus which could be adjusted with sufficient delicacy to turn the lamp so as to make the movement of any value to the engineman. If it were really practicable and important to have a movable headlight, a turntable could readily be arranged to be operated by a rod from the cab, but we understand that the runners on the Indianapolis roads, who have used electric headlights longest, look upon such a device with very little favor. There are curves where there is no intervening bank to obstruct the view, and where a lamp which would throw light on the track some distance ahead would be of service; but the great majority of curves are not thus situated, and every runner knows, from his daylight experience, how few cases there are where a view of the track ahead on a curve would be of value to him. Instances have been published in which the presence of electric headlights has averted a butting collision, even where a curve intervened between the two trains, but in every one of these instances the light prevented the collision, not by illuminating the track ahead, but by illuminating the clouds, or the dust or moisture in the atmosphere, so that the engineman of the other train discerned the approach of the electric light.

We learn from a Kansas paper that the train-caller at the Kansas City Union station, J. F. Gregory, has been obliged to retire from that position because he has lost his voice. He has "long been noted for his stentorian tones," and we are told that the people of Kansas will miss him. We judge from the friendly tone of the paragraph that Mr. Gregory has been an efficient shouter, and we are sorry to hear that he is incapacitated for the pleasant duties of his position. We have no doubt that he was a skillful elocutionist and that when he pronounced the names of a dozen towns in succession he took time to enunciate the words so distinctly as to make them intelligible, at least so far as to make each name plain to the passengers bound for that particular town; but in expressing our sympathy with Mr. Gregory we feel compelled to say that there are numerous other train shouters in large railroad stations whose voices, if they should get lost, would be doing the public a favor. Such an occurrence would be a reason to congratulate the passengers rather than to sympathize with the shouter. Thousands of long-suffering passengers have for years endured the depressing influence of these bawlers' inarticulate attempts to earn their wages, and we are anxiously looking forward to the time when we can rejoice with them over the removal of this cloud on their happiness. By the way, what is the use of giving the name of more than one town, or at most two, in announcing a train? The name or number of the train and suitable placards at the doors ought to meet all reasonable demands of passengers who understand English. And those who do not understand English have to be individually advised in any event; we never heard of a passenger whose native tongue was the same as that of the train-bawler.

We find in the New York *Evening Post* a statement from Mr. J. J. R. Croes, a member of the Palisades Commission of the states of New York and New Jersey, concerning the very important work which that commission has in hand. He says that the Joint Commission feels greatly encouraged by the favorable expression of sentiment not only in states immediately affected, but in all parts of the United States. In the New York and New Jersey legislatures there are bills providing for ceding the land to the United States. The New York bill has already passed the Senate and it is expected will soon pass the Assembly, and the prospect for the New Jersey bill is favorable. A bill authorizing the purchase by the National Government of 2,000 acres, between the Hudson River and the Boulevard, has been introduced in Congress and referred to the Committee on Military Affairs. It appears that the quarrymen who are at work destroying the beauties of the world-famous Palisades are spreading the report that the scheme for the preservation of the Palisades is merely an effort on the part of the quarrymen of Rockland County to drive the owners of the quarries on the Palisades out of business, which, of course, is nonsense. The effort originated in a sincere desire on the part of people of sense and taste to preserve from desecration some of the most beautiful scenery in the world, and it has no other object. Putting the matter on its lowest plane, everybody interested ought to realize that the Palisades pre-

served are worth more money to the nation than could possibly be got out of them by quarrying the rock for road metal. They attract tourists from all over the world, and are important among the influences that have made the scenery of the Hudson famous wherever people read.

A bill has been introduced in the New York Legislature to require more frequent trains on the elevated railroads of New York City, between 8 p. m. and midnight. A bill has been introduced by Mr. Saunders intended to strengthen the law of 1895, requiring railroads to sell 1,000-mile tickets at two cents a mile. A member from Westchester County has introduced a bill to compel the New York, New Haven & Hartford to issue 50-trip family tickets at 1½ cents a mile. Mr. Bauer has introduced a bill in the New Jersey Legislature requiring all electric cable and horse railway companies to erect waiting rooms and transfer stations, to heat and ventilate their cars and charge no more than five cents fare. The provision of drinking water in cars, refreshments and sleep-berths and the regulation of the motormen's health and wages will doubtless be taken care of by a subsequent enactment. A bill has been introduced in the Legislature of Virginia prohibiting the transportation, loading or unloading of freight on Sunday between sunrise and sunset. A bill has been introduced in the Legislature of Kentucky, by Senator Coebel, to repeal the charter of the Southern Pacific Company. The Mayor of San Francisco has lately been "whooping it up" against the Southern Pacific with great vehemence, and it is understood that the Kentucky Senator is acting on a request from San Francisco. The Southern Pacific Company, chartered in Kentucky, operates the lines of the Southern Pacific and allied railroads.

#### NEW PUBLICATIONS.

*A Text-Book on the Mechanics of Materials. Sixth Edition.* By Mansfield Merriman, Professor of Civil Engineering in Lehigh University. 8vo, cloth, 368 pp. with index. New York: John Wiley & Sons, 1895, \$4.00.

This edition contains more than double the matter of previous ones. The first seven chapters, which have been but slightly changed, comprise the matter of former editions and constitute an elementary course in the strength of materials. The remaining chapters, eight to fifteen, are new, and, though of a more advanced character, are written in the same clear style which is found in all Professor Merriman's books, enabling the student to fully grasp the principles set forth after having studied the more elementary part.

The best way of giving a concise idea of the new chapters is to give their headings. These are: VIII., Strength of Materials. IX., Resilience of Materials. X., Tension and Compression. XI., Flexure of Beams. XII., Shear and Torsion. XIII., Apparent Stresses and True Stresses. XIV., Stresses in Guns. XV., Plates, Spheres and Columns.

In the chapter on strength of materials are given tables of mean constants and properties of building materials. Also articles on the fatigue of materials and the effect of repeated stresses, and a short history of the mechanics of materials, which is one of those interesting little historical sketches with which the professor's readers are familiar.

Chapter IX. is devoted to resilience, elastic and ultimate, of bars, beams and shafts, and is of great interest as some important questions relating to impact are set forth for the first time in the English language. There is also given the early history of the investigation of resilience and some modern experiments relating to it.

Chapter X., as indicated by its heading, treats of various stresses. These are of a more complicated nature than those given in the first part of the book, treating of impact considering the influence of the inertia of a bar when struck by a moving body; also of centrifugal stress; stresses in spherical and cylindrical rollers, and the effect of eccentric loads on columns.

Static and sudden deflections are discussed very fully in Chapter XI. Also pressure due to impact, effect of live load velocity on stresses, and deflection due to shearing.

The general heading, Shear and Torsion, describes sufficiently well the contents of the next chapter.

Chapter XIII., true stresses as distinguished from apparent stresses, is one of the most interesting in the book. If an homogeneous parallelepiped be subjected to normal forces, producing the unit stresses  $S_1$ ,  $S_2$  and  $S_3$  on its six faces, those upon opposite faces being equal, then supposing these forces all tensile, the true internal unit stresses in the three directions are,  $T_1 = S_1 - eS_2 - eS_3$ ,  $T_2 = S_2 - eS_1 - eS_3$ ,  $T_3 = S_3 - eS_1 - eS_2$ , in which  $e$  is the factor of lateral contraction and lies between 0 and ½. If any apparent stress  $S$  be compressive, it is to be taken as negative in the formulas. It has been shown that an external shear  $S$  on the web of a plate-girder produces an apparent tension  $S$  and an apparent compression  $S$  in directions at right angles to each other. It is now seen that the true tensile stress is  $S - e(-S) = (1 + e)S$ , and that the true compressive stress is  $-(1 + e)S$ , and therefore the true shearing stress is also  $(1 + e)S$ , or about ⅔  $S$ . The true internal stresses are therefore about 33 per cent. greater than their apparent values and it follows that the real factors of safety in beams and plate-girders are much smaller than generally supposed.

The principles of stresses in guns, a subject the average person knows little about, are clearly set forth in Chapter

XIV. Indeed, it seems as if almost any one with the aid of this chapter could design a fairly good cannon—one that he would not be afraid to stand by when it was fired.

The final chapter, XV., treats of plates under pressure, such as cylinder heads, etc.: of hollow spheres, and a further discussion of columns. Following this is an appendix, containing an experiment on the vibrations of a deflected beam, which originally appeared in the *Railroad Gazette*, and the determination of the velocity of stress.

In short, it may be said that this book will materially assist the student in the pursuit of the noblest of professions.

Throughout, numerous references, numerical problems and illustrations are given, to exemplify the principles; and in the appendix are a number of advanced problems to test one's ingenuity. The book is concluded with tables of logarithms, squares of numbers, areas of circles and weights of wrought-iron bars.

*Home Study.* Scranton, Pa.: The Colliery Engineer Co. Monthly; \$1.50 a year, single copies 15 cents.

A little monthly paper has just been started in connection with the International Correspondence Schools at Scranton, Pa., which is described as "an elementary monthly journal for students of the industrial sciences and readers of the technical press who need a better knowledge of arithmetic, geometry, trigonometry and the principles of physics and drawing to enable them to derive the best results from their reading."

In the number before us an attempt is made to give elementary information on steam engineering, architecture, plumbing, heating and ventilation, geometry, mechanical drawing, the action of pumps, geology, the calculation of earthwork, the dynamo, the principle of moments and still other matters. It will be observed that the field covered is a pretty big one for one month and for a journal of 24 quarto pages; but it is not to be supposed that each reader of the journal will be especially interested in each topic treated, and concerning those topics in which he is especially interested he will find useful information.

There are two sides to the question whether or not it is worth while to try to spread knowledge of applied science by easy and popular methods, but on the whole we are inclined to think that more good than harm is done by such efforts, when they are conscientiously made and directed with reasonable intelligence. It is quite true of all branches of engineering, as well as of other matters, that "a little knowledge is a dangerous thing," and a great deal of human energy has been wasted and worse than wasted by the efforts of men who have got a little superficial knowledge of mechanics and engineering through popular publications. Indeed, we often think that one of the dangers of our country is the disproportion between the intellectual activity of the people and their real education. A great many of the woes which have come upon the Republic are due to the attempts of active-minded and ignorant people to solve the universe. But, on the other hand, it is this very intellectual activity, and the stimulus to thinking and contriving and attempting which our public schools and cheap publications have carried down to the lowest ranks, that gives us a greater relative population to draw from to recruit the classes in our universities and technical schools than any other nation has. So, in spite of the waste which is inevitable from efforts to popularize scientific education, and from efforts to arrive at short cuts to useful knowledge, it is at least a plausible idea that the final result of these efforts is to increase the power and wealth of the nation.

*Annual Report of the Department of Public Works,* City of Buffalo; year ending Dec. 31, 1894.

The annual report of the Department of Public Works of the City of Buffalo is a volume of 436 pages largely made up of detailed statistics of work done. The Chairman of the Board of Commissioners is General George S. Field, M. Am. Soc., C. E., the Chief Engineer is Mr. Samuel J. Fields, M. Am. Soc. C. E., and the Assistant Chief Engineer is Mr. Edward B. Guthrie, M. Am. Soc. C. E.

The bridge work done during the year reported on was but little, new work amounting to only about \$20,000. The street paving was a very important item: 24¾ miles was paved with asphalt at a cost of \$3.09 a square yard, or \$1,699,642 total. About a quarter of a mile was paved with brick at a cost of \$2.79 a square yard. Over 26,000 sq. yds. of asphalt pavement was repaired at a cost of \$1.58 a square yard. The total cost of work executed, outside of salaries and office expenses, was \$2,207,201. From the report of the Bureau of Water it appears that the reservoir, finished July 6, 1894, cost \$557,336 and has a total capacity of over 116 million gallons. During the year over 30 miles of supply main were laid, making a total of 430 miles in the city. The consumption of water per capita is very large, the largest we suppose of any city in the United States, amounting to 252 gals. Pittsburgh consumes 233 gals., Philadelphia 150, Chicago 145, Boston 99, New York City 95. The lowest consumption tabulated in this report is Brooklyn, 80 gals. per head.

The report of the Superintendent of the Bureau of Streets is an interesting general statement of the problem, of the methods in use and of possible improvements. The Superintendent makes one complaint which will apply to every city in the United States so far as we know; that is, of the "senseless practice of scattering waste paper of all kinds by thoughtless and careless

people." This seems to be a peculiar national habit, which is due probably to the fact that not one person in a hundred ever thought that there was the least harm in it. The most aggravating example of the practice that we know of is in Chicago, where the streets are littered from curb to curb with scraps of paper. The moment one crosses the threshold of the best clubs in the city he is confronted by the sight of this offensive litter, not only in the streets but on the sidewalks. We cannot wonder that foreigners have a low opinion of our refinement, with such a sight constantly before their eyes, and it is pleasing to observe that New York has improved very greatly in this particular in the last year or two.

*Proceedings of the Fifth Annual Convention of the Superintendents of Bridges and Buildings.*—The fifth annual convention of the Association of Railway Superintendents of Bridges and Buildings was held last October in New Orleans. We reported its proceedings briefly at the time and gave abstracts of some of the papers. The complete proceedings as they appear in this volume are valuable. The report of greatest value is that on Strength of Timbers Used in Trestles and Bridges, presented by Mr. W. G. Berg, of the Lehigh Valley, which sums up a great deal of information drawn from many sources. We said that this was the report of greatest value. We are not sure, however, that that statement is quite accurate, for an excellent report is on Sand Dryers and Methods of Supplying Sand to Engines, read by Mr. Aaron S. Markley (Pittsburgh & Western), Chairman of the Committee. This gives drawings and descriptions of a number of plants. Another report of decided interest is on Methods and Special Appliances for Building Temporary Trestles Over Washouts, by Mr. George J. Bishop, General Foreman of Bridges and Buildings, Chicago, Rock Island & Pacific Railway. All of these reports and other shorter ones were discussed at more or less length. The Secretary of the Association is Mr. S. F. Patterson, Boston & Maine Railroad, Concord, N. H.

#### TECHNICAL.

##### Manufacturing and Business.

The power house for the Brunswick Traction Co., at Milltown, N. J., will be furnished by the Berlin Iron Bridge Co., of East Berlin, Conn. The engine room will be 64 ft. long and 85 ft. wide and the boiler room 45 ft. wide and 48 ft. long. The side walls are of brick and the roof trusses of iron.

The Latrobe Steel Co. has succeeded to the business of the Chicago Tire & Spring Co. The offices in the Western Union Building, Chicago, will be retained until Feb. 1, when they will be removed to the Old Colony Building. Charles H. Ferry, formerly President of the Chicago Tire & Spring Co., continues with the business.

The National Railway Signal Co. has been incorporated to manufacture railroad signals, both visual and audible, in Sing Sing. Capital, \$100,000, and Directors, W. Irving Lee, Chester A. Weller, John Gibney, Thomas R. Wright, Wm. H. Cullen, Michael Garvey and David Greenthan, of Sing Sing.

The Acme Railway Signal Co. was incorporated Jan. 27 to manufacture railroad signals and other railroad devices in New York city. Capital, \$300,000, and Directors, Wm. F. Chester, Leonard S. B. Hopkins, of New York city; Theodore H. Enis, of Jersey City, N. J.

The first of several steam launches of special design for southern Mexico has just been shipped by the Marine Iron Works, Clybourn & Southport avenues, Chicago, the destination being 3,200 miles from that city. Shipments of this character are safely made by rail for the small and medium sized launches, but for larger work the company builds only the complete outfits of marine machinery and equipment for the native boat builders.

C. B. Colby and P. R. Foley have bought the Dauphin (Pa.) Car Works, and will spend about \$50,000 in preparing the plant for making bridges and architectural and structural iron.

The A. Garrison Foundry Co. is building a mill to roll aluminum for the Pittsburgh Reduction Company at New Kensington. The train consists of a  $\times 28$  84-in. roughing mill for breaking down, and a  $28 \times 84$ -in. finishing mill of improved design.

The Receiver of the Chicago, Indiana & Eastern has been directed by the Court to sell all the rolling stock of the company, consisting of engines, coaches and freight cars and apply the proceeds on the debts of the company incurred for labor and material. The appraised value of the property is \$60,000, and the indebtedness is double that sum.

The Youngstown Bridge Company has established a New York office in charge of Henry A. LaChicotte, M. Am. Soc. C. E., and for the present will occupy offices at 136 Liberty street. The company also has a Baltimore, Md., office at 406 Water street, in charge of H. Ashton Ramsay M. Am. Soc. M. E. Its Southern office at 421 Jackson Building, Nashville, Tenn., is in charge of H. T. Sinnott, and its Fort Worth, Tex., office is in charge of L. S. Leversedge. Its Western office at Keokuk, Ia., formerly in charge of James B. Diver, was discontinued some months ago.

The Brewer Tube Company, of Toledo, O., recently incorporated with a capital stock of \$100,000, has purchased a site, 180 ft.  $\times$  400 ft. and the building, which is to be two stories in height, will be  $112\frac{1}{2} \times 225$  ft.

The C. A. C. Tie Plate & Supply Company, of New York City, has been incorporated to manufacture railroad supplies and appliances; capital, \$5,000. Directors—Charles W. Dorland, Laurence W. Miller and Joseph F. Darling, of New York City.

Notices have been posted at the Sharpsburg, Pa., mill of Moorhead, Bro. & Co., fixing the puddling rate at \$3. It is reported that some of the puddlers were willing to accept the new rate, but others refused. Meantime Amalgamated Association officers are endeavoring to organize the mill.

The Edgar Thomson Steel Works, which have been closed down for several weeks for repairs, have resumed operations.

The Oliver Iron & Steel Co., operating the Hainsworth Steel Works, Pittsburgh, has made a reduction of 10 per cent. in wages. The men accepted it.

The Consolidated Cattle Car Company has been organized, with a capital of \$2,000,000, and with offices in Chicago and St. Louis, to take the cars and carry on the business of the late Hicks Stock Car Company, whose property was sold at auction recently. Charles E. Kimball is President of the company, and Henry W. Gays, Vice-President. The company operates 3,000 cattle cars.

The East Moline Tool Co., East Moline, Ill., capital stock \$76,000, has been incorporated to manufacture machinery: incorporators, Adolph W. Shirring, Charles H. Pope and Edward B. Kreis.

The Clayton Air Compressor Works report a recent sale of a large duplex steam air compressor, of their latest pattern, to the Pennsylvania Railroad, for the various applications of this power in their Altoona shops. This company also has orders for several large compressors from other railroads for their shops using compressed air, and are also making a great many smaller compressors, for testing and inflating hose and bicycle tires and for supplying crude oil burners.

Attorney General Moloney brought quo warranto proceedings in the Circuit Court at Chicago, Jan. 24, against the Illinois Steel Company to have its charter revoked. The company was incorporated in 1889 and includes the North Chicago Rolling Mill Company, the Union Steel Company and the Joliet Steel Company. It is alleged that the company has illegally increased its capital stock to \$50,000,000, representing that this was its authorized stock. The increase in capital stock from \$25,000,000 to \$50,000,000 was voted in Feb., 1892, for the purpose of increasing the capacity of the works. It is the legality of this action which is questioned.

The Phoenix Bridge Company, of Phoenixville, Pa., has secured the contract for the framing of the new United States battleships to be built at Newport News.

##### Iron and Steel.

There was shipped from the Bethlehem Iron Company on Jan. 23 the connecting rod for the steamship Saale of the North German Lloyd Line. This rod weighs about 10,000 lbs., and it was completed within two weeks of the receipt of the order. It was thus a very quick piece of work.

The new steel mill of the Lukes Iron & Steel Works, Coatesville, Pa., will begin work next month. That of the Worth Bros. plant will also start up. These two new mills will give employment to several hundred men.

Press reports say that the Denver & Rio Grande has placed an order with the Colorado Fuel & Iron Co. for 6,000 tons of steel rails for early spring delivery.

The Titusville (Pa.) Iron Co. has been incorporated with a capital of \$250,000, and these directors: John Feitig, John S. and J. C. McKinney, J. J. Carter and B. F. Krafft.

The members of the Amalgamated Association, with Secretary Nutt, of the Iron Manufacturers' Association, constituting the conference committee on the wage scale, met at Youngstown, O., on Jan. 10 and canvassed the sworn reports filed by the iron manufacturers, showing the selling price of bar iron at the mills during November and December. The average of all sales was 1.3 cents, which gives the puddlers an increase of 25 cents per ton, making the boiling scale for January and February \$4.50, and an increase of 2 per cent. to the finishing mills. The advance applies to tonnage men. About 15,000 workmen throughout the country will be benefited.

The National Bar Iron Association met at Pittsburgh, Jan. 21, and completed its organization by electing the following officers: President, James G. Caldwell, Louisville, Ky.; Vice-President, H. T. Wallace, Wilmington, Del.; Treasurer, George M. Bard, Muncie, Ind.; Secretary, J. S. Elverson, Catsaqua, Pa.

The report of the operations of the Cambria Iron Company for 1895 shows that six per cent. was earned on the old capital of \$5,000,000.

The new plant of the Finished Steel Co. at Hazelton, O., Youngstown's suburb, was put in operation last week. Steam and electricity are both employed in operating the plant. Polished shafting is the principal product. The capital stock is \$100,000, and C. Seymour Dutton is President.

The Pencoyd Iron Works, according to press dispatches, has shut down a part of its works at West Manayunk, throwing out about 300 men. It is said that this temporary stopping of work has been caused by delay in the building of the Blackwell's Island bridge, for the steel work of which the company has the contract.

##### Iron and Steel Prices.

Steel billets and Bessemer pig have gone up rather strikingly during the past two weeks. The rise since the first of the year in Bessemer pig is \$2.50, the price being, at furnace, \$12.5, as against \$10 on Jan. 1. We have recorded both the recent placing of the price of coke at \$2 per ton, and the fixing of the price of Bessemer ore for the coming year at about \$4.00. It is probable that the above noted increase in the price of pig, and also the increase of from \$2 to \$2.50 in the price of steel billets, are due to this increased price of raw material.

##### A Large Iron Smokestack.

It is said that the largest iron smokestack ever constructed in New England was erected in Rockville, Conn., last month. It is 100 ft. high, 54 in. in diameter, and weighs 10 tons.

##### Tie Plates.

The Avery Stamping Co., of Cleveland, O., writes to us with regard to the claim made that the Servis patents cover a tie plate with flanges on the under side, running parallel with the grain of the wood. Concerning this the Avery company says that the Fox tie plate made by that company is fully protected by letters patent, and the Avery company will protect all customers using Fox tie plates against loss by infringement.

##### Shelby Car Wheel Iron.

The Shelby Iron Co., of Shelby, Ala., sends us a circular with regard to the merits of Shelby charcoal car wheel iron. Last June a wheel made by the Barney & Smith Car Wheel Co., Dayton, O., was tested in the presence of Mr. J. H. Harris, inspector for the Pennsylvania Railroad. It stood 504 blows of a 140-lb. weight falling 12 ft. It was made of Shelby iron and old wheels. In 1875 the Barney & Smith Mfg. Co., made a set of wheels of Shelby iron which were put in passenger service for test as to durability. They ran 70,000 miles, and two of the wheels, now in the possession of the Shelby Iron Co., would probably stand, easily, 25,000 miles more.

##### Stranding of the St. Paul.

The American Line steamship St. Paul, the second of the two vessels built for the International Navigation Company by the Cramps, went ashore near the iron pier at Long Branch, N. J., on Saturday morning, Jan. 25, at about 1:30 o'clock. There was considerable fog at the time, and the vessel had not sighted a pilot on this account. The passengers and mail were removed during the day, and preparations were made to get the vessel off. Several kedge anchors were sunk about 1,000 yards from the vessel, and from these steel cables led to the steam capstan at the vessel's stern. The first attempt by this means moved the vessel about 170 feet to seaward. Further efforts to remove her were checked by a strong wind which sprang up Sunday night.

##### Car Lighting.

Work is soon to be begun in Washington in building a plant to make and compress oil gas for the use of such railroad and postal cars as are fitted with the Pintsch apparatus.

The Pintsch system is also spreading steadily in India. It has recently been adopted by the Madras Railway and has for some time been used on the Bombay & Baroda, the Central India, the East Indian and the Great Indian Peninsula. Steps are now being taken by other Indian railroads to put in use the same system.

The Lehigh Valley Railroad will shortly begin the work of erecting a Pintsch gas plant at Phillipsburg, N. J. Pipe lines will be run to the depots at both Phillipsburg and Easton, so that all cars can be "gased." The road now gets Pintsch gas at Jersey City and Buffalo, but a number of new coaches are soon to be equipped, and an additional plant is necessary.

It would appear that the directors of the Caledonian Railway Co. are satisfied that oil gas is at present the best railway carriage illuminant in the market, for they have just contracted for the erection of an extensive addition to their gas-making plant. The new works, which will be on the Pintsch principle, already in operation at their Edinburgh, Glasgow and Perth depots, are to be situated near Maryhill, so as to meet the company's increased requirements when the Lanarkshire and Dunbartonshire lines are completed.—*Railway Engineer.*

##### Hall Block Signals on the Atlantic City Railroad.

Officers of the Philadelphia & Reading, which controls the Atlantic City Railroad, announce that the entire road from Camden to Atlantic City, N. J., 56 miles, is to be equipped with block signals. This road does a heavy passenger business in the summer, and it is said that the signals will be ready for use by the opening of the coming season. Hall automatic signals will be used.

##### Lake Superior Iron Ore.

The so-called "Bessemer ore pool" formed by mine operators and sales agents of the Lake Superior district has reached an agreement, except so far as one Mesaba miner, Andrew Carnegie, is considered. Its total allotments of ore for 1896 delivery are 10,500,000 tons, of which nearly 9,000,000 are to be Bessemer, a far greater proportion than ever before. Of the total the new Mesaba range furnishes a third, the Gogebic 2,500,000 tons, the Marquette and Menominee a third and the Vermillion the remainder. The Minnesota Iron Co. is given an allotment of 1,800,000 tons, the Norrie 900,000 tons and the Rockefeller mines on the Mesaba 800,000 tons, all others following. The Carnegie mines are only allotted 450,000 tons and their owners insist on a larger allotment.

**Jersey City Water Supply.**

The question of supplying Jersey City with water appears to be still unsettled. The Supreme Court of the State has set aside the contract made by the city government with the Jersey City Water Company. It is held that the award of the contract was illegal for several reasons, one being that the Jersey City Company was not the lowest responsible bidder. The fact that it offered a larger storage capacity than the lowest bidder could not be taken into consideration. Then the act under which the contractor proposed to condemn certain property of the Morris Canal was not valid for that purpose. The bids for the water contract were: Rockaway & Hudson Co., \$5,650,000; East Jersey Co., \$7,250,000; Jersey City Co., \$7,950,000. When the contract was awarded to the Jersey City Company a temporary supply for one year was contracted for with the East Jersey Company. As our readers know the latter company finds itself unable to supply the amount agreed upon; that is, the capacity of its pipe line fell far short of what it was supposed it would be. So we suppose that there is still an opportunity for other contractors.

**The Reading Subway.**

The Director of Public Works of the city of Philadelphia, Mr. Thompson, says that he expects to be able within 30 days to advertise for bids for the construction of the depressed roadway for the Philadelphia & Reading Railroad, in Pennsylvania avenue, Philadelphia. This important improvement is to separate the grades of the streets and the railroad tracks on the line of the Philadelphia & Reading, approaching the Thirteenth and Callowhill streets freight station, and the estimated cost is \$6,000,000. The receivers of the Reading made an agreement to bear one-half of the cost, paying the city in 30 annual installments. Negotiations have been delayed on account of differences between the city and the railroad as to the quantity of work to be included and as to details of carrying out the undertaking.

**Car Heating.**

In the Circuit Court of the United States for the Northern District of New York, Judge Cox handed down a decision on Jan. 20, 1896, in the case of the Consolidated Car-Heating Company vs. The Martin Anti-fire Car Heating Company, for infringement of the Sewall Coupler patent, in favor of the former company. Judge Cox holds that the patent on the Sewall coupler is "a distinct advance over what preceded it," and its claims are broadly sustained by the Court. The opinion says that if further argument were needed to prove the practical identity of the infringing couplers is shown by the fact that they will couple and uncouple as readily with the Sewall coupler as with themselves.

**The Torpedo Boat Ericsson.**

Secretary Herbert has decided to accept the torpedo boat Ericsson, from the builders, the Iowa Iron Works, subject to a dock trial at New London, to demonstrate that her engines are in good order. The department is satisfied that the boat, when properly handled, can make at least 25 knots per hour.

**The Hollerith Tabulating Machine.**

The tabulating machine invented by Dr. Herman Hollerith, of Washington, D. C., for compiling and recording statistics, is now in use in the office of the Freight Auditor of the New York Central road in New York City, and it is to be given an extended trial. After preliminary tests the officers of the road have decided to put in enough machines to keep the whole of the accounts of the freight department for the entire road for one year, and the machines will be put in operation as soon as they can be got ready. This apparatus was described in the *Railroad Gazette* of April 19, 1895. By its use records are kept by means of holes punched in cards, a single card for each way bill or other unit, and the assortment and addition of items is made automatically by counting machines and electro magnets. Where the amount of work to be done is large the machine effects a decided saving in labor, and at the same time insures accuracy.

**Improvements at Erie Docks.**

The Pennsylvania Company is improving its facilities for handling iron ore at Erie, Pa., and the track facilities are to be enlarged and rearranged, so that a much larger movement can be accommodated than heretofore. The channels adjoining the docks are being deepened by Hingston & Woods, of Buffalo. The new machinery for the rapid handling of ore is to be put up by the Brown Hoisting & Conveying Machine Co., of Cleveland. Probably over \$175,000 will be spent in these improvements.

**THE SCRAP HEAP.****Union Station at Omaha.**

The State Board of Transportation of Nebraska has ordered that the railroads entering Omaha shall, on May 1, begin the erection of a Union Station. The Milwaukee and the Rock Island are, it is said, opposed to the plans submitted.

**Settlement of Jersey City Crossing War.**

A permanent injunction was granted on Jan. 23 restraining the Pennsylvania Railroad from interfering with the National Docks & Junction Company in constructing its tunnel under the roadbed of the Pennsylvania at Point of Rocks, Jersey City. This is said to be the end of a long legal battle that has been waged in the courts for seven years. The tunnel is to be the connecting link between the New Jersey Junction Railroad, which runs north from the Pennsylvania road to the West Shore station at Weehawken and the National Docks Road, running south from the Pennsylvania road to the Standard Oil Company's yard at Cavan Point, Jersey City, and will connect the West Shore, the Lackawanna and the Erie with the Central of New Jersey and

the Lehigh Valley. The right of way was condemned four years ago, and the damages to the Pennsylvania were assessed at \$95,000. The Pennsylvania appealed, and on a new trial the damages were increased to \$130,000. This amount was paid. The Pennsylvania then fought the plans of the National, which, it was contended, would disturb the Pennsylvania's roadbed. The Pennsylvania Company sent a gang of men and filled up the excavation made by the rival company for its tunnel a few months ago. A temporary injunction was then granted, and the National Company was permitted to complete the arch and then stopped. There was a disgraceful fight of the bosses and workmen of the rival companies last August.

**Canals and Harbors.**

A dispatch from Texas indicates that the imagination of a reporter has become inflamed by the arrival at Corpus Cristi of a steam yacht from Detroit. He telegraphs that the yacht has on board a party of capitalists from Michigan who are investigating a project for a coast canal from Galveston to Brownsville. He adds that should the canal be constructed, a daily line of steamers will be run between Corpus Cristi, Galveston and Brownsville, and that surveys will be begun within 30 days and construction within six months.

On the 21st a steamship crossed the bar at Galveston drawing 20 ft. 6 in. This, it is said, is the heaviest draft that ever went over the bar, and shows a gain in depth of 6 ft. in the last year.

A delegation from Philadelphia recently visited Washington to urge appropriations for deepening the channels of the Delaware and Schuylkill. They asked for \$500,000 to dredge the channel of the Delaware to 25 ft. deep and 600 ft. wide and \$25,000 to continue the improvement of the Schuylkill. The delegates said that the city had already spent a good deal of money on the work and had lately appropriated \$500,000 to continue it. Major Raymond, Corps of Engineers, U. S. A., states in his reports that the Government plans to contemplate a channel between Philadelphia and Camden 1,000 ft. wide and 26 ft. draft at an estimated cost of \$3,500,000. A total of \$1,617,000 has been spent on this work. There have been removed by dredging about 13½ million cubic yards of material. For 2.8 miles a depth of 26 ft. has been attained, a minimum width of 400 and maximum of 1,000. The project for the improvement of the Delaware to the Bay contemplates a channel 26 ft. deep at low water and 600 ft. wide. The estimated cost in 1885 was \$2,423,000. To the end of the last fiscal year \$920,913 was spent on the work. Before the improvements were begun the channel had a depth of less than 26 ft. for an aggregate of about 20 miles and a depth less than 24 ft. for about six miles. The total distance to deep water is 61 miles. Dikes of an aggregate length of over 16,000 ft. have been completed and one has been contracted for which will be 26,580 ft. long when done. Of this 6,300 ft. have already been built to the level of low water. The total length of dikes now built (including this 6,300 ft.) under the project is 22,808 ft. The benefits to commerce from the improvements already made have been great.

The river and harbor act of 1894 contained an appropriation of \$25,000 for improving the harbor at Wilmington, Del. The engineer reporting on the permanent improvements recommended dredging, building a flushing tidal basin at the mouth of the river and the extension of the jetties, all of which would cost \$1,269,000. Colonel Hains, U. S. Engineers, is opposed to the tidal basin which, he says, would cost as much in construction and maintenance as it would cost to maintain a channel by annual dredging. The cost of the basin would be \$645,000. It might necessitate the acquisition of land or legal proceedings, which would embarrass the work. The board of engineers which considered the reports pro and con concluded that the construction of this proposed tidal basin is not expedient.

**Great North-rn Improvements.**

The principal improvements made by the Great Northern during the year 1895 were those made upon the Eastern Minnesota, which include a new division terminal at Sandstone, Minn., comprising a yard of 12 tracks, a 20-stall stone roundhouse; a turntable, a cinder pit and a stone oil house. Passing tracks at several stations were lengthened, so that now sidings of 3,000 ft. and 6,000 ft. length are provided alternately at each station. About six miles of second track was built from West Superior to Saunders. A long steel viaduct was built over the switching yards at West Superior. On the main line a new division terminal, similar to that at Sandstone, was built at Melrose. Work was commenced upon a new division terminal at Clancy, Mont., which is now nearing completion. A considerable amount of bridge filling was done where trestle bridges had nearly reached their limit of usefulness.

**Mexican & Guatemala Colonization & Railroad Co.**

The Mexican and Guatemala Colonization and Railroad Company was incorporated at Santa Fe, N. M., last week, by Emil B. Bary, of Boston, and A. L. Morrison, George A. Johnson and E. L. Bartlett, of Santa Fe, to operate in New Mexico and Old Mexico; capital stock, \$10,000,000. The directors are Robert P. Porter, S. W. Allerton, George W. Detwiler, Charles Bary, H. M. B. Bary, Emil B. Bary, A. L. Morrison, George A. Johnson, and E. E. Bartlett.

**No Certificate for the "Bicycle" Railroad.**

The State Railroad Commissioners of New York have refused the application of the Kings, Queens & Suffolk Railroad Company for a certificate to permit the construction of its proposed railroad between Brooklyn and Far Rockaway. There are two railroads already in existence between the termini; if the rates by these lines are too high the state has power to reduce them. The claim of Mr. Boynton, the projector, that his bicycle car "is held upright by its own momentum," is looked upon with suspicion.

**Grain Elevators at Gulf Ports.**

The Illinois Central is making important improvements at New Orleans, as indicated in the *Railroad Gazette* of Jan. 24. Vice-President Harahan states that a grain elevator with a capacity of 1,000,000 bushels will undoubtedly be built very soon. Coincidentally with this announcement comes news from Mobile that General Manager Mann, of the Mobile & Ohio, has secured subscriptions sufficient to put up an elevator at that port with a capacity of 260,000 bushels. It is said that this elevator will be finished within three months.

**LOCOMOTIVE BUILDING.**

The Baldwin Locomotive Works has contracted to build 32 additional locomotives to go to Russia. These engines are duplicates of the 20 ten-wheel passenger engines lately shipped, but the tenders will have eight wheels instead of six. These engines have Vaucain compound cylinders and will burn naphtha. They have three pairs of driving wheels 6 ft. in diameter.

**CAR BUILDING.**

The Cincinnati, Hamilton & Dayton will shortly build two parlor cars and two mail cars.

The Erie Railroad expects soon to let contracts for the construction of 500 double-hopper gondola cars.

The Duluth & Winnipeg has bought 600 25-ton iron ore cars from the Michigan Peninsula Car Co. for spring delivery.

The Lake Shore & Michigan Southern will soon let contracts for the 1,000 freight cars mentioned in our issue of Jan. 3.

The Cincinnati, New Orleans & Texas Pacific will probably build about 150 freight cars of miscellaneous types to replace vacant numbers.

The Cleveland Electric Railroad Co. intends to rebuild its 16-ft. trailing cars into 24-ft. motor cars. Fifty new open motor cars will also be bought.

The South Baltimore Car Works has just contracted to build 400 freight cars for the West Virginia & Pittsburgh. The company has other contracts for 300 cars for various coal companies.

The Elliott Car Works, Gadsden, Ala., are building 150 freight cars for the Chattanooga, Rome & Columbus. Nearly 400 men are now employed in these shops, and there are enough orders on hand to keep them employed for several months.

The shops of the Great Northern at St. Cloud, Minn., are at work on an order for 100 coal cars. These shops are now running at their fullest capacity, orders having been given to put air-brakes and vertical plane couplers on 3,000 freight cars.

**BRIDGE BUILDING.**

**Bradford, Pa.**—The Forman street bridge has been reported unsafe and will be closed to travel. Steps will be taken to build an iron bridge in its place.

If the "Island" site is chosen for a city building, a bridge will be erected at a cost of \$2,200.

**Bridgeport, Conn.**—A drawbridge will probably be built over Yellow Mill Pond near this place. The Board of Public Works has asked that \$57,000 be appropriated for the work.

**Carlisle, Pa.**—Viewers have decided that a new 100-ft. bridge over the Yellow Breeches Creek, near Hatton, is necessary.

**Carlisle, Ill.**—Bids will be received until Feb. 4 for a trestle bridge over the Kaskaskia River.

**Cleveland, O.**—Bids will be received until Feb. 12 for all the masonry work of the substructure and approaches for the Willow street bridge, which is to be rebuilt over the old bed of the river. D. E. Wright, the Director of Public Works, should be addressed.

**Clinton, Ia.**—Bids will be received until Feb. 4 for all the iron and wooden bridges required by Clinton County during the coming year. Mr. D. McCarthy is County Auditor.

**Dauville, Pa.**—Of the 10 bids for the new bridge over the canal at Wall street, that of the Havana (N. Y.) Bridge Co. has been accepted.

**Defiance, O.**—The Brackett Bridge Company has secured the contract for the Defiance and Putnam joint county bridge.

**Detroit.**—Articles of association of the Michigan Central Bridge Company were filed with the Secretary of State (Michigan) Jan. 23, the purpose of the company being to build a railroad bridge over the Detroit River at Detroit. The company is capitalized at \$2,000,000—one-half of the estimated cost of the bridge, which is to be three miles long. The incorporators are Cornelius Vanderbilt, Chauncy M. Depew and C. F. Cox, of New York; H. B. Ledyard, Asahey Pond and Henry M. Campbell, of Detroit, each of whom holds ten shares of stock, and the Michigan Central Railroad Company, which owns 19,930 shares.

**Fort Steele, Wyo.**—A wooden bridge is to be constructed over the Platte River at this place. The piers for the bridge were built sometime ago.

**Hannibal, Mo.**—At the next session of the County Court the question of a bridge across the Minnow Branch, near Frytown, will be discussed.

**Hartford, Conn.**—The Hartford City Council has adopted a resolution ordering the City Treasurer to honor drafts for building a new bridge across the Connecticut to the amount of about \$400,000. An injunction is likely to be asked for in the courts by citizens who oppose immediate building of a permanent bridge. This is the bridge for which the contract was once let and annulled.

**Harrisburgh, Pa.**—City Engineer Cowden has been instructed to prepare plans and estimates for subways at Market and Herr streets. The railroads interested, the Pennsylvania and Philadelphia & Reading, and the Pennsylvania Canal Co., have, it is said, agreed to pay their share of the estimated cost of \$150,000.

A 160-ft. iron or steel bridge will be erected over Mahantongo Creek, near Uniontown, by the joint commissioners of Northumberland and Dauphin counties.

**Hartville, Wyo.**—The contract for the 360-ft. bridge over the Platte River has been awarded to the Wrought Iron Bridge Co., at a contract price of \$3,420. The bridge will be in nine spans of 40 ft. each, and will have a 12-ft. roadway. The piers will be on pile foundations.

**Iowa Falls, Ia.**—Estimates are being made of the probable cost of a new wagon bridge across the Iowa River at this point. B. B. Bliss, a prominent real estate dealer, is said to be back of the enterprise. The bridge is intended to throw open a large tract of land adjoining the business part of the city that has hitherto been inaccessible from any highway.

**Knoxville, Tenn.**—According to reports a commission has been appointed to prepare plans and secure bids for a bridge over the Tennessee River, to be either of stone or steel and to cost \$225,000. The April term of court will act on these plans.

**Macon, Ga.**—A bridge is needed at Spring street over the Ocmulgee River. The structure will, it is estimated, cost about \$40,000, and the County Commissioners are now considering the advisability of its construction.

**McConnellsburg, Pa.**—Viewers have recommended the erection of a new county bridge over Sideling Hill Creek, in Union Township, near the Bedford County line.

**Middletown, O.**—Ten bids have been received for a lift bridge over the canal at Franklin street. The lowest is that of the Hamilton Construction and Tool Co., of Hamilton, O., \$5,125, the highest that of the Brackett Bridge Co., of Cincinnati, \$6,280.

**Miller's Falls, Mass.**—Nothing will be done regarding the rebuilding of the bridge between the towns of Montague and Erving, which was recently washed away,

until after the town meeting to be held March 2. Bids will probably be asked for during the spring for a steel or iron structure.

**Milton, Pa.**—The free bridge over the Susquehanna River, six miles above this place, was opened to traffic on Jan. 22. It connects Northumberland and Union counties.

**New Haven, Conn.**—It is reported that the New York, New Haven & Hartford has been ordered by decision of court to build a new bridge over the crossing at Olive street.

**New York.**—Mr. L. L. Buck, Chief Engineer of the new East River bridge, has made a report in favor of building a structure with sufficient room for six railroad tracks. Four of these tracks are intended for the trolley lines crossing the bridge and two are for the elevated roads. If the width is limited to 118 ft. the footwalks will of necessity be above the carriage ways. Mr. Buck recommends placing them level with the driveway and on the outside. The plan is to put the two elevated road tracks in the middle, with two trolley tracks on each side of them. We reprint the report in full elsewhere in this issue.

The speedy building of the Third avenue bridge over the Harlem and its approaches is the subject of a bill which has been introduced by Senator Cantor in the Legislature. It allows the city to take immediate possession of the land needed for the approaches and provides for payment as soon as the condemnation proceedings are finished. A similar bill passed by the legislature last year was vetoed by the Mayor. Mr. T. C. Clarke, Chief Engineer of the bridge, writes as follows: "The mayor vetoed the last year's bill as the property owners had injected matter into it which the corporation counsel disapproved of as a legislative interference with a pending lawsuit. It has been suggested to abandon the double approaches on the south side of the river, concentrate them into one placed on the north side of Third avenue, where private property would have to be acquired. This would be costly, but would make a far better approach than we were allowed to design."

**Oceanport, N. J.**—The Secretary of War has notified the New York & Long Branch Railroad that its 39-ft. draw, crossing the South Shrewsbury River at this place, must be widened to 60 ft.

**Ottawa, Ont.**—A temporary bridge across the Rideau Canal is to be built, from the foot of Slater street to the temporary station of the Canada Atlantic Railway.

**Oregon, Ill.**—The present bridge over Rock River at this place is considered unsafe, and a new one will probably be jointly built by the county and the town.

**Pennsylvania Railroad.**—In building the new line through Mt. Joy on the Philadelphia Division, Jacob, Barbara, Marietta, Market, Comfort, New Haven and Lombard streets will be bridged with iron structures. Temporary bridges will be erected at several streets to meet the wants of travelers.

**Pittsburgh, Pa.**—E. K. Mase, C. E., has drafted a novel plan for the proposed new bridge over the Allegheny at Fifth street. It is proposed to build the city halls of the two cities on the two ends of the bridge and the Chamber of Commerce hall on the middle pier.

**Quebec, Que.**—It is probable that an iron bridge will shortly be erected to replace Scott's bridge.

**Rat Portage, Ont.**—It is said that the Ontario Government will soon build a steel highway bridge over the west branch of the Winnipeg River.

**Rome, N. Y.**—A bill has been introduced into the legislature for a bridge over the Black River Canal near the present Hurlburt bridge. A provision of the bill is that estimates of cost will be furnished the City Attorney by the City Engineer.

**Saginaw, Mich.**—According to press reports the Secretary of War has approved the plans for a bridge over the Saginaw River to be built by the Interurban Electric Railroad Company.

**Sioux City, Ia.**—The managers of the Iowa & Nebraska Pontoon Bridge Company at this place have been notified by the Secretary of War that now the new Pacific Short Line Bridge has been opened to the public, the temporary pontoon bridge must be taken out within 12 months. The pontoon managers think that by cutting rates they can compete successfully with the Short Line, and may put in a low wagon bridge, for which a charter was granted by Congress a year ago. The estimated cost of such a structure is \$500,000.

The Pacific Short Line bridge over the Missouri River was opened Jan. 21 with appropriate ceremonies. The bridge has been in course of construction for six years, and has cost about \$1,300,000. The length, including two fixed spans, with a draw at either end, is 1,940 ft., and with trestle approaches 4,140 ft. It is 50 ft. wide, with railroad and street car tracks, wagon road and walk for foot passengers. About 7,500,000 lbs. of steel were used in its construction.

**St. John, N. B.**—The local government intends during the coming summer to replace the present bridge at Memramcook with a new steel one.

**St. Thomas, Ont.**—James A. Bell, C. E., is preparing plans for a new steel bridge, to be built west of Belmont. The cost will be borne equally by Elgin and Middlesex counties.

**Superior, Wis.**—The Wisconsin New Duluth Company is the name of a corporation which has just elected officers here and which proposes to bridge the St. Louis River near New Duluth, Minn., about eight miles from the harbor of this city. The officers of the company are: President, George B. Hudnall; Vice-President, James Bardon; Secretary, John M. McCabe; Treasurer, John A. Bardon. The company has an engineer at work upon plans for submission to the Secretary of War. It is claimed that the bridge is intended for a railroad crossing, and that a railroad scheme is back of it.

**Toledo, O.**—The ice gorge in the Maumee River, about eight miles above this city, broke Jan. 26, carrying away two spans of the new bridge in course of construction at this point. The loss is estimated at \$50,000.

**Toronto, Ont.**—The plans for the widening of the Queen street subway will be completed this week at the Engineer's Department. The work will cost about \$130,000.

In a recent message the Mayor speaks of the need of a bridge at King and Queen streets, across the Don River.

**Westfield, Mass.**—The town will shortly erect a bridge about 100 ft. long over the Westfield River, in place of a wooden structure that has been destroyed by fire. A town meeting will be held on Feb. 3 to decide what kind of a structure to put up. Charles N. Oakes is Town Clerk.

**Woodland, Cal.**—The residents of South Putah are preparing to build a bridge across the canal south of Davisville.

**Yankton, S. D.**—Press reports say that plans have been completed for the proposed bridge over the Missouri River at this place.

**York, Neb.**—Bids will be received until Feb. 18 for constructing all bridges required by York County during the coming year. J. D. White, County Clerk, should be addressed.

## MEETINGS AND ANNOUNCEMENTS.

### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

*Long Island*, 1 per cent. payable, Feb. 1.  
*New York, Chicago & St. Louis*, 5 per cent., on first preferred stock, payable March 2.  
*Pittsburgh & Lake Erie*, 5 per cent., payable Feb. 1.  
*Pullman's Palace Car Co.*, \$2 per share, payable Feb. 15.  
*Rome, Watertown & Ogdensburg*, 1½ per cent., guaranteed by New York Central & Hudson River, payable Feb. 15.

### Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

*Cumberland Railway & Coal Co.*, annual, company's office, Place d'Armes, Montreal, Canada, Feb. 12.  
*Eastern Kentucky*, annual, Rivertown, Ky.  
*Huntington & Broad Top Mountain Railroad & Coal Co.*, annual, company's office, corner of Walnut and Fourth streets, Philadelphia, Feb. 4.  
*Mineral Railroad & Mining Co.*, annual, company's office, Broad street station, Philadelphia, Feb. 11.  
*Missouri Pacific*, annual, company's office, St. Louis, March 10.  
*New York, Pennsylvania & Ohio*, annual, company's office, 121 Euclid avenue, Cleveland, O., Feb. 4.  
*Norfolk & Southern*, annual, company's office, Norfolk, Va., March 5.  
*Peoria & Eastern*, annual, Danville, Ill., Feb. 12.  
*Philadelphia & Erie*, annual, Broad street station, Feb. 10.  
*St. Louis, Iron Mountain & Southern*, annual, company's office, St. Louis, March 10.  
*Summit Branch*, annual, 269 Broad street, Philadelphia, Feb. 11.  
*Wheeling & Lake Erie*, annual, company's office, Toledo, O., Feb. 11.

### Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.  
The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.  
The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Tuesday of each month.  
The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.  
The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.  
The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.  
The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m.  
The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.  
The *Western Society of Engineers* meets on the first Tuesday in each month, at 8 p. m. The headquarters of the society are at 1736-1738 Monadnock Block, Chicago. The business meetings are held on the first Wednesday at its rooms. The meetings for the reading and discussion of papers are held on the third Wednesday at the Armour Institute, Thirty-third street and Armour avenue.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets in the Carnegie Library Building, Allegheny, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

The *Denver Society of Civil Engineers* meets at 36 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7:30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday

of each month. S. T. Johnston, Monadnock Block, Chicago, is secretary of the association.

The *Engineers' Club of Columbus, (O.)*, meets at 12½ North High street, on the first and third Saturdays from September to June.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The *Engineers' Society of Western New York* holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

### Engineers' Club of Columbus.

At the regular meeting of the club held Jan. 18, a paper entitled Ventilation was read by Mr. Irvin Butterworth, Manager Columbus Gas Co. The reading of the paper and discussion of same occupied the entire evening.

### Civil Engineer's Club of Cleveland.

The regular meeting of the club was held in the Case Library building, Tuesday, Jan. 14, 1896, at 7:45 p. m. Mr. Walter Miller read an interesting paper, entitled, Quadruple Expansion Engines for Lake Service, and Mr. W. W. Sly gave an illustrated talk on Tunneling Machinery.

### Texas Association of Railway Surgeons.

This association held its third annual meeting at Houston, Jan. 21. The following officers were elected: Dr. J. R. Stuart, of Houston, President; Dr. Letcher, First Vice-President; Dr. Monday, Second Vice-President; Dr. Jemison, Third Vice-President; Clay Johnson, Secretary; Dr. A. A. Bailey, Treasurer.

### West Virginia State Association of Civil Engineers and Architects.

The Association met in Wheeling, Jan. 23. The programme included discussion on Sanitary Plumbing and Sewerage, opened by V. A. Dunbar, of Parkersburg, and a paper on Management of Office Work and Filing of Records, by Otto Schroll, of Wheeling.

### Engineers' Club of St. Louis.

A regular meeting was held Jan. 22. President Okeron called the club to order. Twenty-seven members and five visitors present.

Mr. E. J. Spencer addressed the club on Underground Electrical Service, giving the results of the wide study and varied experience which the speaker had had in work of this character, in different parts of the country. He reviewed the historical features of the subject, explaining the work done both at home and abroad, the difficulties which had been met with and how they had been overcome.

It was not generally known that the first experiments with the Morse telegraph were made with underground circuits; these gave so much trouble that the entire matter was on the point of being dropped, when an assistant suggested trying overhead wires. This being done, the experiment was immediately successful. The speaker explained the work which had been done in New York, Philadelphia, Boston, Chicago, and elsewhere, and regretted the fact that St. Louis was moving so slowly. He stated that there was no city east of St. Louis of 150,000 inhabitants or more which did not have its wires underground in the business districts. He showed a number of samples of cables of different types and for a wide variety of purposes.

Messrs. Moore, Bryan and Flad participated in the discussion.

### Connecticut Civil Engineers and Surveyors.

We spoke last week of the annual address delivered before the Association by President William B. Smith, of Waterbury. The following is an abstract of it:

President Smith's address showed the great amount of work that has been done during the year in improvements on the Consolidated road. The sum expended in the neighborhood of Stamford, improving the track for seven miles, was \$600,000. In making the changes in the line there was a reduction of 47 deg. of curvatures. Work in the town of Stamford itself is now in progress that will cost \$125,000. On the road Southward from Stamford, toward South Norwalk, there is work going on that will cost \$85,000. In elevating the tracks through the city of South Norwalk, the work now going on, there has been expended about \$500,000. It is expected that by April 1 all this work will be completed. The completion of the work now under way will finish the improvement of grades and lines, and the construction of the additional tracks between New York and New Haven, with the exception of through the city of Bridgeport, about 4½ miles. In the work there have been eliminated, between the New York State line and the westerly town line of Stamford, five grade crossings; between Stamford and South Norwalk, six, and through the city of South Norwalk, two. In the work on the Air Line between Middletown and Willimantic, now in progress, about \$50,000 has been expended. There have also been important expenditures on the Hartford division.

## PERSONAL.

—Mr. William C. Watson, formerly General Passenger Agent of the Atlantic System of the Southern Pacific, died at Chicago Jan. 26 at the age of 50.

—Mr. L. Yam Sam, a passenger agent of the Southern Pacific at New Orleans, is now on a four months' vacation, during which he will visit his former home in China.

—Mr. Robert S. Dousman, Assistant General Auditor of the Chicago, Milwaukee & St. Paul, has resigned. He will be succeeded by W. F. Dudley, at present Freight Auditor.

—Mr. George Tozzer, heretofore Superintendent of Stores on the Baltimore & Ohio, at Baltimore, is now Assistant Purchasing Agent of the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati.

—Mr. J. E. Dalrymple, of Chicago, heretofore Private Secretary to Mr. Reeve, Traffic Manager of the Chicago & Grand Trunk, goes to Montreal with his superior and, it is said, will become Assistant General Traffic Manager.

—Mr. Dwight M. Philbin, General Manager of the Duluth, Missabe & Northern road, resigned last Saturday. He is an operating and traffic manager of high ability and much experience on the chief ore roads of the West.

—Mr. John F. Ward, M. Am. Soc. C. E.; Mr. H. Waller Brinkerhoff, M. Am. Soc. C. E., and Mr. Wisner B. Martin, Assoc. M. Soc. C. E., have taken offices together in Aldrich Court, 45 Broadway, New York City, as Consulting Civil and Mechanical Engineers.

—Mr. V. E. McBee has been appointed General Superintendent of the Seaboard Air Line. He has been Division Superintendent at Atlanta since the transfer of Mr.

John H. Winder to Portsmouth last year. Mr. McBee was formerly for many years an officer of the Richmond & Danville.

—It is reported from Topeka that General Auditor W. K. Gillett, of the Atchison, Topeka & Santa Fe, has resigned, to take effect April 1. Mr. Gillett has been with the Atchison six years, previous to which time he was in the auditing department of the New York Central, the Boston & Albany and other eastern roads.

—Mr. E. P. Hannaford, who has been in the service of the Grand Trunk Railway of Canada for nearly 40 years, has resigned his position as Chief Engineer of that road, which he has held since 1869. Mr. Hannaford is about 60 years old and was born in England. Before coming to this country he served several years under Sir I. K. Brunel.

—Mr. Joseph Hobson, for 20 years Chief Engineer of the Western Lines of the Grand Trunk, is promoted to take the place of Mr. Hannaford. Mr. Hobson is also about 60 and was born at Guelph, Ont. He has been connected with many railroads and engineering enterprises in Western Canada, having begun his railroad service in 1858. His greatest work was the St. Clair tunnel.

—Sir Henry George Calcraft, until recently Secretary of the British Board of Trade, died on Jan. 22 at the age of 60. He was appointed to the Board of Trade in 1852 and was Permanent Secretary from 1886 to 1893. He was Assistant Secretary to the Railway Department from 1874 to 1886. He was a director of the Suez Canal Company and of the London, Chatham & Dover Railroad.

—Mr. George W. Feeney, a locomotive engineer of the Philadelphia, Wilmington & Baltimore, who died at Wilmington Jan. 20, is said by local papers to have been in the service of the company more than 40 years. He ran the engine which drew the train carrying Abraham Lincoln to Washington in March, 1861, and also the very last train carrying Mrs. Garfield to Washington in July, 1881, when President Garfield was shot.

—Mr. Victor J. Bradley has been appointed Superintendent of the Railway Mail Service for the second division, with headquarters at New York City, succeeding Mr. R. C. Jackson, who retires after 32 years' service. Mr. Bradley has been Superintendent of a branch post office in New York City and has also had experience in the office to which he is going. Mr. Jackson takes an easier position in the same service.

—Mr. N. E. Savine, who has a contract for construction work on about 25 miles of government railroad in Siberia, is in St. Louis endeavoring to interest American railroad contractors in the enterprise in which he is engaged. Messrs. M. S. Carter & Co. and other St. Louis firms have looked into Mr. Savine's representations, and it is possible that they may do something, though nothing has as yet been decided upon.

—Mr. John H. Winder, General Manager of the Seaboard Air Line, has retired from that office and its duties will be combined with those of the vice-presidency. Mr. Winder is a son of Major John C. Winder, who retired from the vice-presidency of the road a year ago. Mr. Winder has given the newspapers a copy of a letter from President Hoffman continuing the General Manager's salary until next October, and one from Vice-President St. John testifying to Mr. Winder's high character and ability.

—Mr. R. B. F. Peirce, of the Indiana, Decatur & Western, who, according to current newspaper gossip would soon retire as General Manager of that company, will, we are authorized to state, continue in charge of the operation of that road. The Purchasing Agent, Treasurer and a few other officers of the Cincinnati, Hamilton & Dayton have, since Jan. 1, had their jurisdiction extended over the Indiana, Decatur & Western, but except for these changes the road will continue to be operated by the same officers as heretofore.

—Mr. J. H. Barrett, General Superintendent of the Cleveland, Akron & Columbus, has tendered his resignation, to take effect Feb. 1. Mr. Barrett has seen many years of railroad service, beginning on the Pittsburgh, Fort Wayne & Chicago. He was Division Superintendent of the Pittsburgh, Cincinnati & St. Louis for 10 years and has been superintendent of various other roads in the West. For six years, beginning in 1886, he was on the Erie, being Superintendent of Transportation or General Superintendent the greater part of the time.

—Mr. Harvey Middleton, Manager of the Pullman Works of the Pullman Palace Car Co., resigned that position on Jan. 21. He has been succeeded by Mr. Arthur M. Parent, who has been Assistant Manager of the shops at Pullman. Mr. Middleton has been Manager of the Pullman shops since July, 1893, being appointed to the office on the retirement of Mr. H. H. Sessions. Previously he had been Superintendent of Construction at Pullman, going to the Pullman Company in April, 1891, from the Union Pacific, of which he had been Superintendent of Motive Power and Machinery. He has also been Superintendent of Machinery on the Atchison, Topeka & Santa Fe and held a similar position on the Louisville & Nashville for a number of years. His record as a mechanical officer and car builder has been a long and honorable one and his ability is very generally recognized among railroad men.

—Mr. John K. Cowen, for many years General Counsel of the Baltimore & Ohio, has been chosen President of the road, to succeed Mr. Charles F. Mayer, whose resignation was tendered several weeks ago. It is said that negotiations have been had with prominent railroad men familiar with the operating department, with a view to appointing a man of that class to the presidency, but Mr. Cowen was the unanimous choice of the New York and the Baltimore interests, the former of which has recently come into a prominent place in the management of the road. Mr. Cowen was recently elected to Congress, but it is said he will resign his seat. He was prominent in the conferences at Washington a year ago at which the Patterson bill for the amendment of the interstate commerce law was drawn up, and he has also taken an important part in the preparation of the Joint Traffic Association agreement. Mr. Cowen is 51 years old and was born at Millersburg, O. He graduated from Princeton in 1866 and studied law at the University of Michigan under Judge Thomas M. Cooley.

#### ELECTIONS AND APPOINTMENTS.

**Altoona, Clearfield & Northern.**—At the annual election held in Altoona, Jan. 20, F. G. Patterson was re-elected President, and W. W. Yon, Thomas H. Greevy, G. F. Bell, John K. Patterson, E. M. Ames, H. J. Davis, John W. Ebert, Frank Brandt and W. Scott Gwin, Directors.

**Aransas Harbor & Northern.**—The names of the directors of this road were given in the Railroad Gazette of Jan. 17, page 48, but the name of the company was not correctly stated. The President of the company is P. B. McLaran, of Baltimore, Md.; the Vice-President and General Manager is C. H. Sawyer, of Aransas Pass, Tex., and the Secretary is T. B. Wheeler, of the same place.

**Aransas Harbor Terminal.**—The Directors of this company are Alexander Brown, W. H. Brooks, Jr., C. H. Sawyer, D. T. McLaran, N. J. Burrows, T. B. Wheeler and Thomas H. Franklin. Mr. Wheeler is the Secretary, with office at Aransas Pass, Tex.

**Atlantic & Pacific.**—The appointment of C. W. Smith as Receiver to succeed Aldace F. Walker and John J. McCook, will take effect Feb. 1.

**Baltimore & Lehigh.**—At the annual meeting of stockholders in Baltimore, Md., Jan. 21, the following officers were re-elected: John W. Brown, President, and John McHenry, Secretary and Treasurer. The Directors chosen were W. W. Spence, Alexander Brown, George C. Jenkins, John S. Young, John K. Cowen, Solomon Frank, John W. Hall and John Wilson Brown.

**Baltimore & Ohio.**—John K. Cowen has been chosen President, to succeed C. F. Meyer. Mr. Burns, having announced his intention to retire from the board at its next regular meeting, Mr. George C. Jenkins has retired from the directorship until that period; and Mr. Edward F. Bacon, President of the Baltimore & Ohio Southwestern, was appointed to fill the vacancy on the B. & O. directory.

**Burlington & Hinesburgh.**—The officers of this company, which is constructing a railroad in Vermont, are: President, William G. Dacey, 40 Wall street, New York City; Treasurer, C. W. Brownell, and Chief Engineer, F. O. Sinclair, both of Burlington, Vt.

**Central Vermont.**—At an adjourned annual meeting of the stockholders in St. Albans, Vt., Jan. 22, these directors were elected: E. C. Smith, F. E. Stranahan, F. F. Ranlet, St. Albans; Charles M. Hays, Charles Perry, John Bell, Montreal; E. B. Smalley, Burlington, Vt.; W. Seward Webb, Shelburne, Vt.; Robert Coit, New London, Conn.

**Chicago & Grand Trunk.**—C. M. Hays, by virtue of his appointment as General Manager of the Grand Trunk, becomes President of the Chicago & Grand Trunk.

**Chicago Great Western.**—R. F. Malone has been appointed Ticket Auditor, with headquarters at St. Paul.

**Cleveland, Akron & Columbus.**—J. H. Barrett having resigned as General Superintendent, taking effect Feb. 1, Mr. J. H. Sample has been appointed Acting General Superintendent, and will assume duties as such on that date.

**Dallas Terminal.**—At a meeting of the directors, at Dallas, Tex., the following officers for the ensuing year were elected: W. C. Connor, President; Alex. Sanger, Vice-President; E. M. Reardon, Treasurer, and W. S. Simpkins, Solicitor.

**Fort Wayne & Jackson.**—At the annual meeting of the stockholders, held in Jackson, Mich., Jan. 25, the following were chosen Directors for the ensuing year: Samuel Sloan, R. G. Holston, Lawrence Turnure, W. D. Searles, Samuel Sloan, Jr., Stephen S. Palmer, Henry Beste and William S. Sloan, of New York; J. M. Root and Dwight Merriman, of Jackson, and J. F. Joy, of Detroit. The road is leased to the Lake Shore & Michigan Southern.

**Grand Trunk.**—George B. Reeve has been appointed General Traffic Manager, with headquarters at Montreal.

**Illinois Central.**—Robert Kirkland has been appointed Freight Claim Agent for the Northern and Western Lines, taking effect Feb. 1.

**Lake Erie & Western.**—J. H. Sample has been temporarily released from the duties of General Superintendent. The authority of the following named officials has been extended over the Northern Ohio Railway: Mr. D. S. Hill, General Superintendent, and Mr. G. T. Jarvis, Assistant General Superintendent.

**Lehigh Valley.**—At an adjourned meeting of the stockholders, held Jan. 22, the old Board was re-elected: President, Elisha P. Wilbur; Directors, Charles Hartshorne, William L. Conyngham, William A. Ingham, Robert H. Sayre, James I. Blakslee, John B. Garrett, Charles O. Skeer, Beauveau Borie, Joseph Wharton, Thomas McKean, George H. Myers, Eugene Delano. Out of a total of 610,580 shares voted, 527,780 shares were voted for President Wilbur and the first eight directors. Messrs. Wharton, McKean, Myers and Delano were unanimously elected.

**Newport & Sherman's Valley.**—At Newport, Jan. 14, these Directors were elected: H. H. Bechtel, W. H. Gantt, B. M. Eby, Geo. Fleisher, James Everhart, J. A. Gray and B. P. Hooke.

**Perry County (Pa.).**—These Directors were elected at New Bloomfield, Jan. 18: President, Chas. H. Smiley; Directors, Chas. H. Smiley, Chas. A. Barnett, Silas W. Conn, John H. Sheibley, H. C. Shearer, Abraham Bower, John Wister, L. C. Zimmerman, D. B. Milliken, Samuel Ebert, James McLehenny, S. R. Lightner.

**Philadelphia & New England.**—At the annual meeting of the stockholders, held at Easton, Pa., last week, the following officers were elected: President, Charles Stewart, of Easton; Directors, P. E. Farnum and O. P. Howell, of Port Jervis; H. B. Wells and J. H. Van Etten, of Milford, Pa.; Col. A. B. Lewis, Philadelphia; General Roy Stone, Washington, D. C.; T. A. H. Hay, James R. Zearfoss, Horace L. Magee, W. H. Tinsman, Easton, Pa.; J. R. Bennett, New York City; Dr. P. F. Fulmer, Dingman's Pa. The directors organized and elected James R. Zearfoss Vice President, W. H. Tinsman Secretary and J. H. Van Etten Treasurer.

**Pittsburgh, Cincinnati, Chicago & St. Louis.**—M. Dunn, late road foreman of engines, has been appointed to succeed W. C. Arp as Master Mechanic at Dennison, O.

**Portland & Ogdensburg.**—The stockholders of the company have re-elected the same Directors who served last year. The Board is as follows: Samuel J. Anderson, Weston F. Milliken, Charles H. Amsden, James F. Hawk, Thomas P. Shaw, George W. True, John W. Deering, James P. Baxter, Edward B. Winslow, Theodore A. Joslin. Following the stockholders' meeting the directors organized, electing Samuel J. Anderson President and John W. Deering Clerk.

**Rock Island, Muscatine & Southwestern.**—The President of this new Illinois railroad is Daniel Hayes, Omaha, Neb.; Vice President, William McEniry, Rock

Island, Ill., and Secretary, James G. Britton, Andalusia, Ill.

**Seaboard Air Line.**—Vice-President E. St. John has issued a general order assuming the duties of General Manager, in place of John H. Winder.

**South Shore.**—At the annual meeting in Montreal last week the old Board of Directors was re-elected: President, Hon. L. Tourville; Vice-President, J. M. Fortier; Directors, J. R. Wilson, Geo. Ball, L. Rene Beauchemin, H. J. Beemer and Joel Leduc. Ed. C. Lalonde was appointed Secretary and H. Beauchemin, General Manager.

**Stony Creek (Pa.).**—These officers were elected at Norristown Jan. 20: President, James Boyd; Secretary and Treasurer, Howard Boyd; Directors, John Slingluff, David S. Heebner, O. G. Morris, Samuel Dresher, John Jamison, John Overholtzer, F. D. Sower, John S. Heebner, Daniel C. Getty, J. P. Hale Jenkins, W. H. Slingluff, Wm. Stahlner.

**Wisconsin & Michigan.**—The annual meeting of this road was held in Marinette, Wis., Jan. 22 and the following officers were elected: President, S. N. Fischer; Vice-President, John Bagley; General Manager, J. N. Faithorn; Treasurer, J. C. Ames, all of Chicago. The Lake Michigan Transportation Company, which runs the car transfer boats for this road between Peshtigo and South Chicago, held its annual meeting at the same time and elected the following officers: President, J. C. Ames; Vice-President, J. N. Faithorn; Secretary, J. E. Williams; Treasurer, S. N. Fischer.

**Worcester, Nashua & Rochester.**—At the annual meeting Jan. 22 the following Directors were elected: Charles A. Sinclair, John A. Spaulding, E. B. Stoddard, Frank Jones, George W. Armstrong, Charles Holman, Frank G. Clark, Frederick S. Moseley and Albert Wallace. These were all re-elections with the exception of Mr. Wallace, who succeeds Frank A. McKean, of Nashua, N. H. The road is leased to the Boston & Maine.

#### RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

**Abbeville & Waycross.**—It is reported that this road, from Abbeville, Ga., southward to Lulaville, 18 miles, is to be extended four miles, to Fitzgerald, an enterprising new town known as the Grand Army Colony. A large number of men have been put at work, and it is said that the track will be completed within a week or two, the grading being mostly finished. The completion of the road is said to be the result of an arrangement made by the Fitzgerald colony with the Georgia & Alabama Railroad, which runs east and west through Abbeville. The Tifton & Northeastern, which approaches Fitzgerald from the south, is also being extended to that town. Four hundred men are now at work on the line. The completion of these two roads would make a pretty direct line from Abbeville on the Georgia & Alabama southward about 40 miles to Tifton on the Brunswick & Western, one of the divisions of the Plant System.

**Ann Arbor.**—The company has decided to shorten the line between Ann Arbor, Mich., and Whitmore Lake, and a new line, about 7½ miles long, will be built. The right of way has all been secured and work will be begun as soon as the frost is out of the ground. The new line will be only about three-fourths as long as the existing road, and the grade will be much easier. The town of Emory will be deprived of a railroad by the change.

**Aransas Harbor & Northern.**—The Secretary of this company, Mr. Wheeler, informs us that the survey of the line from Aransas Pass, Tex., toward Smithville, Bastrop County, Tex., 150 miles, will be begun this week, the preliminary examination of the ground having been nearly finished.

**Aransas Harbor Terminal.**—This company, controlled in the same interest that proposes to build a railroad from Aransas Pass to Smithville, Tex., has its local line partly built, and the officers say that large forces will be at work by Feb. 1. The contract for the completion of the road has been let to J. P. Nelson, of San Antonio. The line is 10 miles long from Aransas Pass to Mustang Island, passing Harbor Island, on which are the deep water docks. Mr. W. D. Jenkins, of Aransas Pass, is Chief Engineer both of this company and the Aransas Harbor & Northern.

**Buffalo & Susquehanna.**—It is reported that President Goodyear and others interested in this road, have bought the partly graded roadbed formerly known as the Tonawanda Valley, between Rushford and Arcade, N. Y., with a view to building an extension from Wells-ville northward, but we cannot find that any surveys are being made, or that any definite plans have been laid out.

**Carolina Midland.**—The reports which have been current for several weeks, to the effect that this road, which now runs from Allendale to Seivern, S. C., would be extended, have been confirmed, and agents visited New York to make arrangements to that effect a week or two ago. Col. Brown has telegraphed from New York to Governor Evans, of South Carolina, that he has succeeded in completing all the arrangements for the extension of the road to Greenwood, S. C., 60 miles. The new company will be known as the Greenwood, Anderson & Western.

**Chicago & Great Western.**—Representatives of this company are reported to have purchased right of way at Manly, Ia., for a short extension into that city.

**Chicago & Southern Illinois.**—This company has been organized to build a railroad from Hampton, Ill., on the Peoria, Decatur & Evansville, southward about 40 miles, to St. Elmo, on the Vandalia Line. The incorporators are A. W. Hubbard and M. S. Carter, of St. Louis; N. R. Olcott, M. H. Luff and John W. Griswold, of East St. Louis. The capital stock is \$500,000. The survey has just been started, and it is expected to begin active construction work in 30 days. The Chief Engineer is N. R. Olcott, who has been Chief Engineer of the Chicago, Paducah & Memphis, and other roads built in Illinois in the last few years. His address is care of M. S. Carter & Co., of St. Louis.

**Delaware & Hudson.**—It is said that a second track will be laid on the Susquehanna division, between Delanson and Nineveh, N. Y., just east of Binghamton. This is the busiest part of the road, the coal trains from the Pennsylvania mines reaching the division at Nineveh, and all trains then using it as far as Delanson, where freight for eastern points takes the route via Mechanicsville.

**Delaware & Hudson Canal Co.**—This company is preparing to build a second main track from East Worcester to Schenectady, N. Y., 9.42 miles, and also from Oneonta to Unadilla, a distance of 15.42 miles, making a total of 24.84 miles. The work will all be done by the company's forces.

**Duluth, Mississippi River & Northern.**—Press reports state that a contract has been awarded for extending this road to Hibbing, Minn. President, A. W. Wright, Alma, Mich.

**Duluth & North Dakota.**—This is the name of a company which has filed articles of incorporation in North Dakota to build a railroad from Drayton to Portal, 250 miles. It is said that the line is already partly graded. Mr. D. W. Hines, of Drayton, is one of the incorporators.

**Duluth & Northwestern.**—This road, projected by the Merritts, of Duluth, will be the fourth Mesaba road which has been located. Construction is looked for in the spring. It will be about 75 miles long.

**El Paso & White Oaks.**—H. C. Lowrie, Chief Engineer of the road, started out from El Paso, Jan. 15, with a party to make a final survey of the road from El Paso to White Oaks, N. M., 148 miles. It is now promised that the construction of the road will begin at the eastern end of the line by March 1.

**Eureka & Klamath.**—This road was incorporated at Eureka, Cal., Jan. 10, with a paid up capital stock of \$500,000. The charter calls for a road for general passenger and freight traffic.

**Georgia & Alabama.**—A press dispatch from Savannah states that the officers of this company have not been able to agree with the Central of Georgia officers upon a valuation for the line of the Savannah & Western, between Lyons and Savannah, about 75 miles. This road is used by the Georgia & Alabama to reach Savannah, but since the trackage agreement was made in 1891 there has been dissatisfaction on the part of the Georgia & Alabama and its predecessor company, the Savannah, Americus & Montgomery. The reorganization of the property gave the new company funds, and it has proposed to buy the Savannah & Western line, or if such an agreement could not be made, to build an independent line into Savannah.

**Gulf & Interstate.**—The company has resumed its tracklaying on the twelve mile section between the ends of track now built out of Galveston and Beaumont. This will complete 70 miles of road.

**Hudson & Aldie.**—It is proposed to build a new railroad in Virginia to be known by this name and extend over the following route: From a point opposite Washington, D. C., westward to Hudson, thence to Arcola and thence to Aldie, Va. The promoters of the scheme have applied to the Virginia Legislature for a charter. Following are the incorporators: John S. Duffie, Jacob W. Starr, Charles W. Starr, Joel Grayson, R. A. Baker, Benjamin P. Detwiler, Benjamin C. Garrett, Enos L. Garrett, W. F. Middleton and others, of Fairfax County, Virginia.

**Illinois Central.**—It is reported that this company has surveyors in the field laying out a line for a short extension to Hammond, Ind., via Whiting.

**Lehigh Valley.**—The company has decided to relocate about 1½ miles of the road near Hazleton, Pa., where there has been a great deal of trouble, in consequence of the excavations made in coal mines beneath the track undermining the roadbed. Traffic has had to be suspended a number of times, and on Jan. 20 a passenger train was derailed, killing the engineer. The line will be located a little to the north of the present location. The contractors for the work are Messrs. McDonald & Sayre, of Hazleton, Pa. The road between Hazleton and Stockton is temporarily abandoned, and trains will be run by way of Audenried, Jeaneville and Beaver Meadow, making a difference of 18 minutes in the running time between Hazleton and Hazle Creek Junction.

**Maine Central.**—The company is taking advantage of the mildness of the winter to continue improvements usually laid over until spring. It has a large gang of men at work double-tracking the road between Yarmouth Junction and Brunswick, and has also started work on a second track between Newport and Detroit, which will be ready in season for the summer business.

**Manchester & Milford.**—This project, a short line, by which the Fitchburg road, now controlling the Brookline & Milford, aims to reach the city of Manchester, N. H., has been strenuously opposed by the Boston & Maine, and a commission appointed by the Supreme Court of the state has made an investigation. This commission has just reported to the court, and it is said that all points are decided against the Manchester & Milford.

**Michigan & Ohio Belt Line.**—This road was incorporated in Ohio Jan. 16 to build a branch from Williams County, O., through Fulton, Henry, Wood and Seneca Counties to connect with the Toledo, Columbus & Hocking Valley. Mr. J. W. Boynton, Grand Rapids, Mich., President of the Central Michigan Railroad, is also President of this line.

**Missouri & Milledge.**—This company has been organized at Kansas City, and the charter for the company is to be filed in Missouri this week. The railroad is projected to extend from Marshall, Mo., south through Sedalia and Springfield Mo., and into Texas, a route over which much surveying has been done by other companies in recent years. The Missouri Consolidated Coal & Mining Co. has been organized by the same interests, and is said to own much mining land along the route of the proposed railroad.

**New Roads.**—The Lake Superior Consolidated Mines has bought for \$150,000 the Mesaba Chief Mine, on the western Mesaba, which will necessitate the building of a new road 10 miles long.

**New York, Philadelphia & Norfolk.**—This company has applied for authority from the Virginia Legislature to extend its line in and around Portsmouth. This road is a division of the Pennsylvania. It is believed that the N. Y., P. & N. intends constructing a belt road around Portsmouth, with branches into the trucking section adjacent to the city.

**Ohio River & Charleston.**—This road contemplates the extension of its line in North Carolina and South Carolina, and preparations are being made for an immediate survey of a line from Shelby, N. C., to Spartanburg, S. C. This road was formerly the Charleston, Cincinnati & Chicago.

**Ottawa, Arapuri & Parry Sound.**—The contract for the construction of the uncompleted portion of this road has been awarded to E. F. Farquhar, of Toronto. The amount of the contract is said to be about \$450,000. It is probable that Mr. Farquhar will sublet the contract for bridges and culverts along the line toward Parry Sound, Ont.

**Peoria, Lacon & Northern.**—The directors of this company have decided to make another survey from

Peoria, Ill., to La Salle. The company was organized a month or two ago for the purpose of building a railroad from Peoria to Spring Valley, about 50 miles, but the preliminary surveys have been hindered by floods.

**Rock Island, Muscatine & Southwestern.**—This company, which has lately been incorporated to construct a railroad between Rock Island and Muscatine, Ill., 25 miles, expects to develop valuable fields of coal and potter's clay along the line. The survey is now being made, under the direction of Mr. John C. Kille, of Rock Island.

**Restigouche & Victoria Colonization.**—This is the name of the company, referred to in these columns last week, which has been incorporated to build a railroad from Campbellton, N. B., southward to Van Buren and St. John River, about 106 miles. The President of the road is F. R. Boselly, Toronto; Secretary, H. C. Secord, Toronto; Treasurer, George de Mets, New York. The Manager is E. A. Charters, of Sussex, N. B.

**Tallahassee Southeastern.**—The projectors of this Florida road expect to begin work in February. The line is from Tallahassee, Fla., southeast to Old Town on the Suwanee River, about 100 miles. Under the name of Florida, Georgia & Western a few miles of track was laid near Tallahassee in 1893, and 35 miles more was graded. The President of the company is Mr. Edward Lewis, of Tallahassee, and it is said that the company will do the construction work with its own forces.

**Texas & Pacific.**—The branch between Sherman and Denison, Tex., has recently been opened for traffic. It was built under the name of the Denison & Pacific Suburban; and is 7½ miles long from a point three miles east of Sherman to Denison on the main line. The construction work was completed in December.

**Virginia.**—The following companies have applied to the Virginia Legislature for articles of incorporation: American Central Trunk Line; P. H. McCaull, of Rockingham; Portsmouth, Gilmerton & Smithfield; M. D. Eastwood and others, incorporators; Willoughby Spit & Old Point.

**Washburn, Bayfield and Iron River.**—It is stated that bids will shortly be received for building this road from Bayfield, Wis., via Washburn to Iron River, 68 miles. The surveys have been completed, and right of way granted. There have been deposited with the Milwaukee Trust Co. \$240,000 in bonds, voted by Bayfield County, and a like amount of stock issued by the railroad company. Another line to be operated in connection with the new road, will, it is said, be built from Iron River to Sandstone, Minn., to connect with the Great Northern. The officers of the new company are: President, W. E. McCord, of Chippewa Falls, Wis.; Vice-President, I. H. Wing, of Bayfield, Wis.; Secretary, J. A. Jacobs, Washburn, Wis.; Chief Engineer, Geo. L. Davis, of Grand Rapids, Mich.

**Yazoo & Mississippi Valley.**—A five mile extension of the Tallahatchie branch beyond Minter City, Miss., has just been opened for traffic. This branch is now 45 miles long, its terminus being at the Tallahatchie River, opposite Philip City. It extends east of Clarksdale, on the line south of Memphis.

#### Electric Railroad Construction.

**Allegheny, Pa.**—The Allegheny Traction Co. has completed a preliminary survey for the extension of the Millvale, Etna & Sharpsburg branch to Glenshaw.

**Annapolis, Md.**—Incorporation papers of the Washington, Annapolis & Chesapeake Railroad have been filed with the Secretary of State. It is proposed by the charter to build a line from Washington to Annapolis, a distance of 27½ miles. Gen. J. B. Seth, of Baltimore, is counsel and one of the incorporators.

**Buffalo, N. Y.**—The Railroad Commissioners of the State of New York rejected last week the application of the Buffalo Traction Co. to construct 66 miles of street railroad in Buffalo. The application has been vigorously fought by the Buffalo Street Railway Co., which now controls all the principal street railroads of the city. The Board decided that the lines proposed by the Traction Co. are not necessary for public convenience as the territory through which 40 miles of the proposed 66 would extend is already well supplied by the lines of the Railway Co. The Board does, however, state that there is need for additional railroad construction in probably 18 or 20 miles of Buffalo streets. In spite of a lengthy report by the Commissioners, showing that the present facilities of transportation are adequate to meet present demands of traffic there is a great deal of dissatisfaction at the refusal of the Traction Company's application. Many citizens and most of the newspapers of Buffalo are in favor of the new company, evidently believing, justly or unjustly that the Buffalo Railway Company does not give adequate service.

The Buffalo Traction Co., was incorporated last October and has a capital of \$3,000,000. Among those interested in the road are Edwin G. B. Miller, Joseph R. Mayer, Washington Bullard, and Herbert P. Bissell of Buffalo, Richard Ladenburg, John K. Page and Lou's Kahn of New York, and Tom L. Johnson of Cleveland. The company says the decision of the Railroad Commissioners will not be accepted as final in the matter, and it is generally thought that an appeal will be made to the Supreme Court.

About a month ago the Traction Co. obtained the franchise of the line known as the Elmwood Avenue and Tonawanda Electric Railroad, and the company has made application to the Board of Aldermen to extend this road into the city. This move is taken to avoid the necessity of obtaining the consent of the Railroad Commissioners. The application was referred to the Committee on Streets.

**Coloma, Mich.**—Work has been commenced on the electric railroad in Berrien County, to extend from this place to Paw Paw Lake. Efforts are now being made to have the line extended to Benton Harbor, on Lake Michigan, to connect with lake steamers.

**Cornwall, Ont.**—The contract for an electric road in Cornwall was let last week to Hooper, of New York and Starr, of Montreal. The Town Council voted \$500 yearly to the company to maintain the pavement between the rails and 18 in. on each side. The contractors expect to have cars running by June. W. R. Hitchcock, of Cornwall, is one of the promoters.

**Denver, Col.**—The Aldermen last week sustained the Mayor's veto of an ordinance granting a franchise to the Denver Consolidated Tramway Co. to pass in front of the Union Station and to connect its Twenty-fifth street line with the Stout street road.

**Elmira, N. Y.**—A bill has been introduced in the State Legislature appropriating \$5,000 to construct and

equip an electric railroad spur into the grounds of the Elmira reformatory connecting with the main line railroads nearby.

**Frederick, Md.**—The board of directors of the Frederick & Middletown Electric Railroad has awarded the contract for the trestling on their road to Chas. Poole, of Frederick. Several hundred men are now at work on the road, and if the weather continues favorable for working for two weeks the grading between Frederick and Braddocks will be completed, and the trestling will be begun.

**Hull, Que.**—T. Viau is forming a stock company to build an electric railroad here seven miles long, and also furnish electricity for lighting.

**Los Angeles, Cal.**—The Pacific Electric Railroad, of which E. P. Clark is manager, is rapidly approaching completion. It is the intention of the company, if a franchise can be secured, to extend its line at Santa Monica, on Ocean avenue, along the bluff.

**Montebello, Que.**—Application has been made for a charter for an electric railroad to be known as the County of Labelle Electric Railway Co., to run from Montebello to Hartwell, a distance of nearly 30 miles. The proposed line will pass through Papineauville, St. Andre Avelin and Ripon. Mr. Poulin, of Montebello, is one of the principal promoters of the line.

**New York.**—The New York & Staten Island Traction Co. was incorporated this week with a capital of \$2,500,000, to construct railroads and other works of improvement, presumably on Staten Island. Charles L. Horton, Arthur D. Chandler and William Ray Morrison, of New York, are some of the directors.

**Port Jervis, N. Y.**—The Board of Trustees has granted a franchise to the Port Jervis Electric Street Railway Co. The terms of the franchise require that at least 2½ miles of road be in operation in 1896, one additional mile in 1897, and one mile in addition thereto in 1898. The company has till March 1 to accept the grant, and must begin work by June 1.

**Richmond, Va.**—The Richmond Traction Co., which is building an electric railroad in Richmond, expects to have the road in operation about April 1. There will be 14 miles of double track, two-thirds of which is completed and the power-house is also under construction. Jas. F. Bradley is the contractor and the officers are: John Sbelton Williams, President; W. M. Habibston, Vice-President and General Manager, and A. Langstaff Johnston, Consulting Engineer.

**San Francisco, Cal.**—The Bryan street electric line is completed and will be in operation as soon as the dynamo is in operation.

**Wabash, Ind.**—Charles Everett, of Fort Wayne, is projecting an electric railroad across Wabash County, and has asked a subsidy of \$75,000 from the county.

#### GENERAL RAILROAD NEWS.

**Baltimore & Ohio.**—On Jan. 24 Mr. Cowen, General Counsel of the company, was elected President, and it was announced that arrangements have been made with a strong syndicate in New York to provide for all the present financial requirements of the company, and the Chairman of the Finance Committee, Major Alex. Shaw, was authorized by the Board, with the approval of the Finance Committee, to continue his negotiations with the syndicate, and complete the permanent collateral trust loan which the syndicate has agreed to take, and which is intended to take care of all the floating debt of the company, and also to meet its demands for such new capital as is now required.

**Cape Fear & Yadkin Valley.**—A change in the provisions of the Baltimore plan of reorganization is contemplated. Owing to the large increase in the earnings within the last few months, the reorganization committee has determined to retire at the end of four years at 105 the \$500,000 of first preference 4½ per cent. twenty-year bonds. For this purpose proceeds from the \$531,000 of general mortgage bonds held in reserve by the plan will be used. The committee has instructed its counsel to push forward foreclosure proceedings as quickly as possible and hopes to obtain a decree early in February.

**Chicago, Milwaukee & St. Paul.**—The statement of earnings for December shows gross, \$2,764,652, an increase of \$561,129 as compared with the same month of the previous year, and net \$1,396,859, an increase of \$335,612. For the six months ending Dec. 31 the gross earnings were \$18,067,722, an increase of \$3,272,632 as compared with the corresponding period of the previous year, and net, \$7,902,595, an increase of \$2,568,533.

**Cleveland, Cincinnati, Chicago & St. Louis.**—The gross earnings for December were \$1,159,424, a decrease of \$35,149 as compared with the same month of the previous year, and net \$219,400, a decrease of \$29,624. For the six months ending Dec. 31 the gross earnings were \$7,388,495, an increase of \$351,676, as compared with the corresponding period of the previous year, and net \$1,957,312, an increase of \$180,696. Fixed charges were \$1,424,149, leaving a surplus of \$533,163, an increase of \$178,727.

**East Louisiana.**—This road, about 24 miles long, between Pearl River and Covington, La., on the north side of Lake Pontchartrain, and which reaches New Orleans over the tracks of the New Orleans & Northeastern, is reported to have acquired control of the New Orleans & Spanish Fort Railroad, a short line on the south side of the lake. The latter is narrow gage but is to be made standard gage, and standard gage cars and engines have already been ordered for this service by the East Louisiana. Three new standard gage locomotives have just been received.

**East & West.**—This Alabama road, which was recently sold under foreclosure, has been reorganized, and a charter for a new company has been obtained in Georgia.

**Fort Worth & Denver City.**—The reorganization committee, under the plan outlined in the *Railroad Gazette* of Jan. 3, reports that over three-quarters of the bonds have been deposited, and informs bondholders who have not yet subscribed to the plan that they must deposit their bonds before Feb. 1 or they will be subject to the penalties the committee will then impose. Under the mortgage, bonds not deposited will not be entitled to any interest for five years, and will also be deprived of the bonus paid on each bond of \$275 in preferential dividend stock.

**Georgia & Alabama.**—The Superior Court of Sumter County has denied the petition of the holders of the floating debt of the old Savannah, Americus & Montgomery who sought to obtain priority over the old Savannah, Americus & Montgomery bonds, and the

\$300,000 reserved under the plan of reorganization to meet these claims can now be used for other purposes.

It is reported that this road has acquired the Abbeville & Waycross, as noted elsewhere in this paper.

**Intercolonial of Canada.**—A dispatch has gone the rounds of the press to the effect that the Dominion Government proposes to sell the Intercolonial Railway to the Grand Trunk and the Canadian Pacific. We are informed by officers of the road that there is no foundation whatever for this story. It originated with the opposition press, and the idea is not at all popular in the country served by the Intercolonial.

**Kentucky Midland.**—Judge Cantrill of the State Court at Frankfort, Ky., has issued an order for the sale of the road. The court has fixed \$240,000 as the lowest bid that will be received. The road extends southeast of Frankfort to Paris, and is about 40 miles long.

**Little Rock & Memphis.**—The foreclosure sale of this road, which was to have occurred at Little Rock, Ark., on Jan. 22, was again postponed. The date of the postponed sale has not yet been announced. The three postponements have been at the request of the bondholders. It is understood that their plans for reorganization will be formulated within a month.

**Macon & Birmingham.**—A dispatch from Macon, Ga., states that the sale of the road to Messrs. Edwards & Parsons, of Boston, for \$200,000 has been confirmed by the Superior Court. Prior to the reorganization of the Georgia Southern & Florida, this road was operated in connection with that line. It is understood that the purchasers represent a majority of the bonds. The impression is that the property was bought in the interest of the Southern Railway, which now controls the Georgia Southern & Florida.

**New York, New Haven & Hartford.**—The company has petitioned the Massachusetts Legislature for leave to acquire land in Boston between the passenger station of the Old Colony and Federal street. Bostonians who hope that a Union station will be established profess to find in this application an indication that the company has plans for a Union station under consideration, but Federal street is on the east of the present station, while to make a union with the Boston & Albany station it would be necessary to acquire land on the west. The bill proposed by the railroad company provides for the issue of \$1,000,000 of new Old Colony stock.

**Omaha & St. Louis.**—At the foreclosure sale of the road in Omaha, Jan. 27, the property was bid in by C. B. Gold, of New York City, for the bondholders, the price being \$1,560,000. The only other bidder was W. C. Winston, who is said to have represented the Wabash.

**Pennsylvania.**—The statement of earnings of all lines east of Pittsburgh & Erie for December shows an encouraging increase of business. The gross earnings for the month increased \$485,815, the total being within \$300,000 of the highest on record, that of 1892. The net earnings were \$150,779 more than last year or within \$16,000 of the best December record, which was made in 1893. The following shows the comparative statement:

	1895.	1894.	Increase.
Gross earn.....	\$5,639,604	\$5,153,789	\$485,815
Oper. exp.....	3,939,907	3,604,871	335,036
Net earn.....	\$1,699,697	\$1,548,918	\$150,779

The following shows the earnings for the calendar year:

	1895.	1894.	Increase.
Gross earn.....	\$64,627,178	\$58,704,284	\$5,922,894
Oper. Exp.....	44,914,309	40,363,744	4,550,565
Net earn.....	\$19,682,869	\$18,340,540	\$1,342,329

The lines west of Pittsburgh for December show a gross increase of \$425,264 and a net increase of \$212,362; and for the year, a gross increase of \$4,591,314 and a net increase of \$2,769,369.

In the suit of the City of Burlington, N. J., against the Pennsylvania Railroad Company to restrain the road from laying a second track through that city, Vice-Chancellor Bird has filed an opinion sustaining the city. The railroad company has no legal right to make the improvement without the consent of those authorities and special legislative action. The railroad company held that it had a right under the charter of the Camden & Amboy, and an agreement entered into between that company and the municipal authorities of Burlington in 1833, when permission was granted to lay rails. The Vice-Chancellor decided that without express legislative authority authorizing it, a steam railroad company cannot construct its tracks longitudinally through the streets of any municipality in the State without the consent of the municipal authorities, and says that whatever may have been the rights of the railroad company to lay the first track, which has been allowed to stand unquestioned for 60 years, there is certainly no existing right by which the second track may be laid.

The decision interferes with the contemplated improvements of the railroad through New Jersey, which have for their object the material shortening of the time required to run trains from Philadelphia to the seashore.

**Philadelphia & Reading.**—The statement of the Receivers, showing the business for month of December, gives the earnings as follows:

	1895.	1894.	Inc. or Dec.
Gross earn.....	\$1,833,257	\$1,551,978	I. \$281,279
Oper. Exp.....	1,017,518	947,067	I. 70,451
Profit in oper.....	\$815,739	\$604,911	I. \$210,828
Net rec'ts from other source's	75,339	72,942	I. 2,397
Profit for month.....	\$891,078	\$677,853	I. \$213,225
Equipment payments, terminal trackage, improvements and renewals, and one-twelfth of current yr's fixed charges (estimated).	\$853,168	\$866,388	D. \$13,220
Surplus.....	37,910	111,465	I. 73,555
* Payments of Car Trust Certificates.....	520,000	.....	.....
Deficit after all payments.	(\$482.09)	.....	.....

\* These certificates matured during the years 1891 and 1895, and are not a charge against the business of December.

† Deficit.

The statement of the Coal and Iron Company shows gross receipts of \$2,216,357, and gross expenses of \$2,298,779, leaving a loss from mining of \$82,422. To this is added \$95,000, one-twelfth of the current year's fixed charges, thus making the deficit for the month \$177,420. For December, 1894, the deficit was \$293,428.

**Plant System.**—The Sanford & St. Petersburg Railroad, a narrow gage line extending east and west across the central part of Florida, and now a portion of the Plant System, has been made standard gage between Trilby and St. Petersburg, 75 miles. This division of

the Sanford & St. Petersburg connects the West Coast route of the Plant System with Port Tampa by a route north of that via Lakeland, and about the same length.

**Southern.**—The statement of earnings for the month of December, and for six months from July 1, shows:

	December.	1895.	1894.	Inc.
Mileage.....	.....	4,494.24	4,494.24	.....
Gross earn.....	.....	\$1,820,871	\$1,677,181	\$143,690
Op. exp. and taxes.....	.....	1,187,643	1,086,537	101,106
Net earn.....	.....	633,228	590,644	42,405
Per cent. exp. to earn.....	.....	65.2	64.7	.....
Half year.	.....	.....	.....	.....
Gross earn.....	.....	\$10,325,496	\$9,640,606	\$684,890
Op. exp. and taxes.....	.....	6,820,965	6,428,541	392,424
Net earn.....	.....	\$3,504,530	\$3,212,065	292,465
Per cent. exp. to earn.....	.....	66	66.6	.....

**Union Pacific.**—The reorganization plan of the Union Pacific, which has already been accepted by a majority of the security holders of that company, has been accepted by a majority of the consolidated first mortgage bondholders of the Kansas Pacific division. The bonds heretofore deposited with the independent Kansas Pacific Committee amount to \$10,400,000 out of \$11,000,000, and will now be turned over to the general reorganization committee of the Union Pacific.

#### Electric Railroad News.

**Brooklyn.**—The Brooklyn Rapid Transit Company has been incorporated with a capital stock of \$20,000,000, and the preliminary tax of \$25,000 has been paid. This company is a reorganization of the Long Island Traction Company, under the plan proposed by a Committee on Reorganization last June. It is proposed to issue \$7,000,000 of 5 per cent. bonds, to be secured by a mortgage on all the property of the new company. Each stockholder of the Long Island Traction Company assenting to the reorganization plan will receive one share of new stock for every two shares of old stock, new bonds for the amount of the cash subscription of \$10 a share paid, and new stock to an amount equal to 75 per cent. of the amount of the cash subscription of \$10 per share paid.

**Detroit, Mich.**—Albert Pack, of the Detroit Railway, has agreed to sell to T. L. Johnson, of the Citizens' Street Railway Co., \$100,000 stock held by him and his friends in the older street car concern. In return for this the Citizens' Co. has agreed to allow the cars of the Detroit Railway to use the Griswold street tracks of the Citizens' Co. as terminals.

**Hagerstown, Md.**—A bill has been introduced into the Maryland Senate to amend the charter of the Hagerstown City Passenger Railroad Co., increase the amount and reduce the par value of the shares of stock of the company, and empower it to build branch roads to towns in Washington County.

**New York City.**—Mayor Strong has signed the resolution passed recently by the Board of Aldermen, calling upon the Eighth Avenue Railroad Co. to extend its tracks from 150th street to 159th street.

**St. Louis, Mo.**—The Railroad Committee has granted an ordinance to the Central Railroad Co. to operate cars over the tracks of several street car lines in the city. The bill has yet to be brought before the Council.

#### TRAFFIC.

##### Traffic Notes.

The Supreme Court of Nebraska has declared the "transfer switch law" unconstitutional.

The amount of building stones shipped to eastern cities from Bedford and Bloomington, Ind., in 1895 was 1,560 car loads.

The Cincinnati, Jackson & Mackinaw now runs passenger trains through to and from Cincinnati over the Cincinnati, Lebanon & Northern, and the Cleveland, Cincinnati, Chicago & St. Louis. Two trains will be run each way daily.

According to the New York Sun, limited tickets which have been altered by having the holes filled up with paraffin are very common nowadays. It is said that certain railroads have instructed conductors to test limited tickets by the use of the thumb nail so as to detect plugged holes.

The farmers in Northern Texas are complaining loudly because the railroads are taking corn to New Orleans and Galveston from Kansas City cheaper than from Texas points. A temporary reduction of 2½ cents per 100 lbs. has been made from North Texas points, but still the rates are as high as from Kansas City.

Press dispatches indicate that the members of the Southern States Freight Association have held protracted conferences looking to an agreement upon percentages of freight traffic between important competitive points. It is proposed to make differential rates wherever necessary to equalize traffic conditions.

The Pennsylvania Railroad has filed an amendment to its answer in the suits begun against it some time since by Harrisburg shippers, alleging violation of the long and short haul law. This law is embodied in the constitution of Pennsylvania, and the highest court has recently decided that no legislative enactment is needed to put it into effect. The Pennsylvania Railroad now claims that the alleged lower charge for a longer haul was justified by dissimilarity of conditions. A defense is also made on the ground that a part of the traffic is interstate.

Freight rates on lumber from Saginaw and other prominent Michigan shipping points, southward, were slightly reduced a few weeks ago, since which time there has been considerable disturbance, competing markets having alleged serious injury to their business. The shippers of Toledo are the most prominent complainants, and rates from that city to points in Ohio and Indiana have now been reduced about two cents per 100 lbs. The reductions from Toledo affect the market at Cleveland, and rates from the latter city have been reduced; to Cincinnati from 9 cents to 7½ cents, and to Columbus from 7 cents to 6 cents.

#### Chicago Traffic Matters.

CHICAGO, Jan. 29, 1896.

The record for forming traffic associations was broken in Chicago last week by the general passenger agents of the lines of the Central Traffic Association, who, after a two days' session, reached an agreement on all points and formed the Central Passenger Committee. The territory covered by the new compact will be the same as the old Central Traffic Association, but there are more roads in the agreement, all of the Chicago & Ohio River lines being in the new organization. With the exception of a few up-to-date changes, the new agreement is about

the same as the old one. Penalties for violations are provided for, and all questions that cannot be settled by the commissioner are to be referred to a board of arbitration, composed of members of the association. At the third day's session rules and by-laws were adopted and an executive committee was elected. The members of this committee are Frank Reed (L., N. A. & C.), D. B. Martin (C., C. & St. L.) and A. J. Smith (L. S. & M. S.). The differential fare principal is recognized under the new agreement, which will become effective Feb. 1. Mr. F. C. Donald, for several years Chairman of the Central Traffic Association's passenger department, was elected Commissioner of the new committee by acclamation. The Central Passenger Committee will be, so far as practicable, entirely independent of the Joint Traffic Association. The headquarters of the new committee and its Commissioner will be in Chicago.

The Western roads leading into Chicago believe they have solved the troublesome \$2 per car stock yards trackage charge. When the Illinois Railroad Commissioners and the United States Court ruled that the roads could not legally make an extra charge for hauling live stock to the Union Stock Yards they did so on the ground that the Union Stock Yards had always been the recognized terminus of the Western lines in delivering stock, and that few of the roads had facilities of their own for handling stock in Chicago. The Western roads have now resolved to build yards of their own, and shippers will be given the option of consigning their stock to the railroad's yards, where no switching charge will be made, or to the Union Stock Yards, where the charge is exacted. This will place the responsibility for this charge on the Union Stock Yards Company, where it belongs. The Alton is putting its old stock yards in Chicago in shape to be used. The Burlington has about completed its own yards at Morton Park, the Santa Fe has nearly finished stock yards at Corwith, and the St. Paul and the Northwestern are considering plans for new yards. The Santa Fe and Burlington yards are about six miles from the city. The former will have a capacity of 50 cars a day, and the latter will be somewhat larger. The eastbound lines from Chicago have agreed to continue the \$1 per car trackage charge at the stock yards, and the Chicago and Ohio River roads have taken similar action.

The lines both east and west of Chicago are having trouble over the limitations of tickets for the big meetings to be held next summer. Officers of the G. A. R. say that unless the return portions of tickets to their encampment at St. Paul next September are extended to 30 days the encampment will be held in some other city, probably Buffalo. The St. Paul lines say that the rate made for this meeting—one cent a mile—is too low to permit of such extended limits. The citizens of St. Paul are greatly agitated over the matter, but the roads have thus far refused to make the extension. The Joint Traffic Association is not inclined to allow a 60-day limit to tickets to the National Educational Association convention, to be held at Buffalo next July. These people are also up in arms and say they will accept nothing less than 60 days. The Pacific coast roads have offered the National Educational Association people a 60-day limit to their tickets if the meeting is held at Los Angeles.

All of the Chicago-Kansas City lines will come out with new time-tables Feb. 2, lengthening the running time of passenger trains between the two cities from 15 hours to 15 hours and 45 minutes.

After a three days' conference in Chicago last week, the executive officers of the Southwestern roads agreed to divisions of grain from Southwestern Missouri River points to the East and to ports on the Gulf of Mexico. These divisions will date back from Jan. 1. This agreement will restore grain rates in the Southwest and will check the tide of grain shipments from Kansas and Nebraska to the Gulf ports, where the bulk of the export traffic has gone during the past few months.

At a recent meeting of the general freight agents of the eastbound lines it was agreed to recommend to the general managers that the elevator allowances of the Wabash and Michigan Central roads be met by all of the other lines. It was also agreed that pending the decision of the general managers all of the roads should ignore the allowances of these two lines.

The pool which the Chicago and Ohio River roads have entered into on theatrical and special party business is working very smoothly. The business is divided equally and each road takes its turn with special parties. The pool of the Chicago-St. Paul roads in the same traffic, however, exists in name only, the manipulation of the ten-ride party tickets having played havoc with this agreement. The scalpers at St. Paul and Chicago have formed a pool and take turns in selling these tickets. They turn over all their party business to one of their number one day and to another the next. The general managers have this week discussed several schemes to stop this abuse, and it is quite likely they will agree on the abolition of the tickets in the entire Western territory.

Eastbound freight rates from Chicago are now being absolutely maintained at tariff. Total shipments eastbound, exclusive of live stock, by all lines for the week ending Jan. 25, amounted to 77,704 tons, compared with 77,011 tons for the previous week, an increase of 693 tons, and against 54,963 tons for the corresponding week of last year. The proportions carried by each road were:

Roads.	WEEK TO JAN. 25.		WEEK TO JAN. 18.	
	Tons.	p. c.	Tons.	p. c.
Michigan Central.....	8,315	10.7	8,547	11.1
Wabash.....	7,752	9.9	7,554	9.8
Lake Shore & Mich. South.	11,267	14.6	9,557	12.4
Pitts., Ft. Wayne & Chicago	6,804	8.8	7,321	9.6
Pitts., Cin., Chi. & St. Louis.	8,415	10.8	8,283	10.0
Baltimore & Ohio.....	5,593	7.2	4,122	5.3
Chicago & Grand Trunk....	6,899	11.4	11,807	15.3
New York, Chic. & St. Louis	6,650	8.6	7,545	9.8
Erie.....	8,985	11.5	8,201	10.0
C., C., C. & St. Louis.....	5,224	6.7	4,078	5.3
Totals.....	77,704	100.0	77,011	100.0

Of the above shipments, 5,546 tons were flour, 44,926 tons grain and mill stuffs, 10,186 tons cured meats, 8,768 tons dressed beef, 1,554 tons butter, 1,436 tons hides, and 3,416 tons lumber.

#### Southeastern & Mississippi Valley Freight Rate Committee.

Representatives of roads in the territory south of the Ohio River east of the Mississippi and west of the territory of the Southern States Freight Association met at Louisville Jan. 22, and formed an association under the above name. The roads represented were the Louisville & Nashville; Nashville, Chattanooga & St. Louis; Southern Railway; Memphis & Charleston; Mobile & Ohio; Chesapeake, Ohio & Southwestern and the Cincinnati, New Orleans & Texas Pacific.